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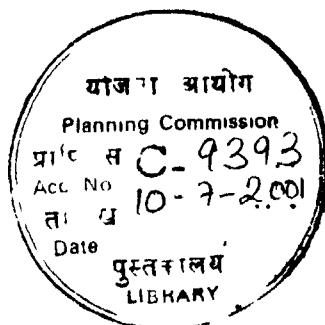
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REPORT
OF
THE WORKING GROUP
ON
MAJOR & MEDIUM
IRRIGATION PROGRAMME
FOR
THE IX FIVE YEAR PLAN
(1997-2002)



GOVERNMENT OF INDIA
MINISTRY OF WATER RESOURCES
CENTRAL WATER COMMISSION

1996

No.8/10/95-P&P
GOVERNMENT OF INDIA
CENTRAL WATER COMMISSION

201, Sewa Bhawan, R.K.Puram,
New Delhi-110 066.

Dated the 17th June, 1996

To:

The Secretary,
Planning Commission,
Yojana Bhawan,
New Delhi-110 001.

Sub: **REPORT OF THE WORKING GROUP ON MAJOR AND MEDIUM
IRRIGATION PROGRAMME FOR THE IX FIVE YEAR PLAN.**

Sir,

The Working Group on Major & Medium Irrigation Programme for the IX Five Year Plan was constituted by the Planning Commission vide letter No.25(1)/A/96-I&CAD dt.31.10.95 with Secretary, Ministry of Water Resources as the Chairman and the Member (Water Planning and Projects), CWC as the Member Secretary. The Working Group held three(3) meetings and also constituted four sub-groups to examine in detail the important aspects relating to efficient irrigation management, strategies for successful implementation of the plans, employment generation, and mobilisation of adequate resources for the sector. Apart from the detailed discussions in the meetings of the Working Group, the State Irrigation Secretaries were addressed to review the performance of the 8th Plan and make the proposals of the IX Plan. The requisite information was received from several States. For the States from where no response was received, the information available in Central Water Commission and Planning Commission were utilised to review the performance and formulate the proposals for the major and medium irrigation schemes in the IX Plan.

The summary of the important recommendations made by the Working Group is given at the beginning of the report. The report also takes an over view of the irrigation programme right from the beginning of the first Plan and also gives an over all perspective of the future.

From the V Plan onwards there has been a considerable proliferation of schemes taken up by various States without matching increase in financial outlays. This has resulted in thin spreading of the resources

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resulting in time and cost over runs of several ongoing projects. It is considered imperative that all out efforts are made to break the vicious cycle of time and cost over run of projects by providing adequate outlays and enforcing strict discipline in the implementation of the projects as per schedule.

The recommendations for the IX Five Year Plan are based on objectives that full funding shall be provided for all the major and medium projects identified for completion during the IX Plan. It is proposed not only to provide the full spillover cost but also to add the cost due to escalation of prices for such projects during the IX Plan. Based on the information received from the States and available in Central Water Commission the proposals and the progress of the major and medium projects have been reviewed and it is expected that 104 major and 248 medium schemes can be completed during the IX Five Year Plan provided adequate funds are made available and proper implementation ensured by the States.

To maintain continuity in the development of the irrigation sector and accomplish the targets in irrigation potential in a given time frame, it is necessary that the new schemes are taken up during the IX Plan. Some ongoing projects where the expenditure is less than 5% during the VIII Plan have been considered as new projects. Based on the recommendations received from the State Governments it is proposed to include 78 major and 139 medium schemes during the IX Plan. The need for taking up new projects in states where irrigation development is relatively low have been duly considered. It should, however, be ensured that the new schemes are based on adequate field investigation and surveys with necessary approval for techno-economic and environmental consideration before specific allocation are earmarked for such projects.

Besides, the major and medium schemes it is also necessary to take up the schemes for remodelling and modernisation proposed by the various states so that the existing systems which are not functioning efficiently can be improved to provide optimum benefits. It is proposed that 42 new schemes in the category ERM will be taken up as against 67 ongoing and 2 new ERM schemes which are scheduled to be completed during the IX Plan. Provisions have also been made in state sector for special repairs of existing systems, Dam Safety measures, improved water management, R&D, Training etc. A total outlay of Rs.54313 crores has been proposed in the State sector for the development of major and medium irrigation in the IX Plan.

It is noticed that a number of inter-state and some important projects are suffering for want of funding from the concerned State Governments. Since a number of such schemes are spilling over and are likely to be taken up in the IX Plan, it is envisaged that central control of the funding of such projects will be necessary to ensure their implementation as per schedule. The inter-state projects are normally executed by the River Boards and Control Boards with officials from Government of India and concerned State Governments. The interstate projects which would be supplying drinking water requirements to major cities are also included in this category to ensure their timely completion. During the IX Plan, a fund of Rs.5,000 crores have been recommended to cater to the requirements of the various inter-state and other important projects which are presently ongoing and are likely to be taken up in the IX Plan on the basis of matching grant.

The centre has to play important role in the national level water resources development plans and coordination with states in activities relating to Research & Development, Dam Safety, National Perspective Plan, National Hydrology Project, Irrigation Management etc. An outlay of Rs.745 crores has been proposed in the Central sector for these activities. With the special Central assistance of Rs.5,000 crores proposed for the interstate & other important projects on the basis of matching grant the total Central sector outlay for major & medium irrigation in the IX Plan will be Rs.5,745 crores.

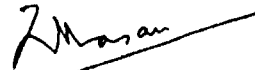
Besides, the strategy and proposals for the IX Five Year Plan in respect of the major and medium irrigation schemes, the Working Group report also covers other important issues affecting the implementation of major and medium projects. These include basin-wise development plans, strategy for improving irrigation efficiency, people's participation in irrigation management and recovery of O&M costs, malady-remedy analysis to ensure proper implementation of the plan, improving statistical data base and organisational capabilities, mobilization of adequate resources for the sector, employment generation and the S&T Programme. Separate chapters have been devoted to cover these subjects.

It is expected that the total Public Sector outlay for the IX Plan will be of the order of Rs.700,000 crores. Realising the importance of Major & Medium irrigation sector and its contribution to the economic growth of the country a total outlay of Rs.60,000 crores proposed for this sector is considered reasonable as it would constitute less than 9% of the total outlay. It is hoped that these recommendations of the Working Group would greatly facilitate in overcoming the present problems faced by the major and medium sector.

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On behalf of the Working Group, it is my pleasant duty to forward herewith a copy of the report of the Working Group. I take this opportunity to record my profound thanks and gratitude to Shri Hanumantha Rao, Shri J.F. Mistry, Shri Basawan Sinha and Shri S.T. Deshpande chairmen of the different sub-groups and all the members and convenors for their excellent cooperation and support in preparing their reports in the limited time. I am also grateful to the officers and staff of Central Water Commission for their painstaking endeavour in compilation and analysis of voluminous data and preparation and typing of the report. Special thanks are due to Dr. M.S. Reddy, Secretary (Water Resources) the Chairman of the Working Group and all the members of the Working Group who have provided invaluable guidance for the preparation of this Report.

Yours faithfully,



(Z. HASAN)
Member (WP&P), CWC
& Member Secretary
of the Working Group

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A N N E X U R E S

AnnexI(1)	Office Order No.25(1)/A/96 - I&CAD dt.31.10.95 of the Planning Commission Constituting the Working Group & subsequent addendum letters dated 5.1.96, 6.2.96, 14.2.96 & 17.4.1996.
AnnexI(2)	Office memo no.8/10/95 - P&P / 53-93 dt.19.1.96 & even no dt.9.2.96 of CWC constituting the sub-groups.
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SUMMARY OF RECOMMENDATIONS

Chapter I

Brief Review of the overall performance of Major & Medium Irrigation

1. Working Group recommends that the States should reassess the ultimate irrigation potential that can be created through each project i.e. projects completed, ongoing and yet to be taken up.
2. Each State should prepare its own perspective Plan for full development of balance potential spreading over the required number of years (not exceeding 20 years) keeping in view the availability of funds and infrastructures.
3. States should lay emphasis for completion of as many ongoing projects as possible by ensuring efficient management and financial discipline.
4. W.G. recommends setting up of 3rd Irrigation Commission to inter alia review the Ultimate Irrigation Potential in the country from various sources as also the irrigation potential created and utilised.

Chapter II

Performance of the VIII Plan

1. The Working Group recommends that States should provide adequate funding for Major & Medium Irrigation sector commensurate with the approved outlay by the Planning Commission.
2. Working Group recommends that frequent changes in scope of the projects should be avoided. In the event of major changes in the scope of works, State Government should prepare and submit the revised DPR as per guidelines of CWC for techno-economic appraisal & subsequent investment clearance of the Planning Commission.

3. Working Group emphasises that annual rate of funding for the projects should be proportionate to Plan outlay & should cover inflation cost.
4. The estimated cost for each project should be revised\updated every year in order to reflect realistic spillover costs. The revised estimated cost should invariably be included in the State Annual Plan proposals.
5. Working Group recommends that taking up of new projects should be restricted until the ongoing projects are completed to prevent thin spreading of resources.
6. All the ongoing and new projects of 8th Plan on which the expenditure incurred is less than 5% are to be treated as new projects of IX Plan.
7. The States should expedite the investment clearance for the projects found techno-economically acceptable by TAC and also expedite techno-economic clearance and investment clearance for unapproved projects.

Chapter III

Strategy and Size of IX Plan

1. The basic strategy for implementation of projects would be to provide full funds as per the scheduled plan of construction so as to complete maximum number of ongoing projects as well as selected new projects and achieve the target of creation of irrigation potential within scheduled time frame
2. To ensure completion of schemes in a planned manner, diversion of funds from one scheme to another should not be permitted i.e. there should be specific earmarking of funds for all the schemes under construction and effective monitoring by High Level Committee comprising of project, State and Central officials.
3. Only such projects should be posed for external assistance where all the infrastructural works, layout and detailed designs of headworks, main canal and major structures are either ready or could be provided within time schedule.

4. It is envisaged that 104 major and 248 medium projects and 69 ERM Schemes would be completed during the 9th Plan. To maintain the continuity of development of Major and Medium sector to ensure creation of Irrigation Potential as per the Master Plan of States and for removing regional imbalance and development of tribal and drought prone areas new projects, as proposed by the States have been included in this category.
5. New projects once taken up after technoeconomic, environmental and investment clearance should be provided with funds as per scheduled plan of construction to avoid time and cost overrun.
6. The Working Group recommends that States should accord priority to multipurpose projects having hydel component over thermal power projects in execution of new projects.
7. The Working Group recommends that State and Project level monitoring units should be strengthened and streamlined for effective implementation of on going projects as per scheduled plan.
8. In addition to projects funding, Plan outlays are to be provided separately for
 - i) Special repairs of existing irrigation systems
 - ii) Dam Safety Measures.
 - iii) Improved Water Management.
 - iv) Survey and Investigation
 - v) Research & Development.
 - vi) Training.
 - vii) National Hydrology Project.

9. Size of IX Plan will be as under:

A. States Plan

a) Projects Included in IX Plan

	Major	Medium	ERM
i) Spillover from previous Plans	119	176	67
ii) New in IX Plan	78	139	42
Total	197	315	109

b) Projects to be completed in IX Plan (Nos.)

	To be completed			Likely spillover to X Plan		
	Major	Medium	ERM	Major	Medium	ERM
i) Spillover Projects	99	176	67	20	-	-
ii) New Projects	5	72	2	73	67	40
Total	104	248	69	93	67	40

c) Outlays (Rs. Crores) As proposed

i) Liabilities of Completed Projects	205
ii) Ongoing Projects	40623
iii) New Projects	13750
iv) Special repairs of existing irrigation systems	880
v) Dam Safety Measures	665
vi) Improved Water Management	1939
vii) Water Development :	
a) Survey & Investigation	485
b) Research & Development	346
c) Training	201
d) National Hyd. Project	219
Total	59313
Less Central Assistance for Interstate & Important Projects (-)	5000
	54313
viii) Benefits (Mha.) Irrigation potential to be created	9.50

B. Central Plan**Rs. Crores**

i)	Existing Organisations under MOWR	371.00
ii)	Research & Development	50.00
iii)	Dam Safety Assurance & Rehabilitation Project	29.00
iv)	National Hydrology Project	129.00
v)	National Irrigation Management Institute	21.00
vi)	Reassessment of Irrigation Potential	23.00
vii)	Central Assistance for WALMIs	71.00
viii)	Central Assistance for Inter-state and Important Projects	5,000.00
ix)	Outlay for capital works	51.00

Total

5,745.00

Total of Central & State Plan

Rs. 60,058

Say Rs. 60,000 Crores

10. In order to ensure that funds are spent in techno-economically sound projects, it is absolutely necessary that no outlays are proposed by State Governments for unapproved schemes.
11. There have been many instances where after approval of the Planning Commission, revised estimates of projects are not sent to the Centre for examination in which the cost have increased manifold. In many cases, the original scope of project is changed. In order to have a financial discipline, it is also necessary that funding for such projects is discouraged unless the revised estimates are duly approved and investment clearance accorded.
12. In order to achieve targetted completion of projects in IX Plan and thereby achieving the targetted potential, the construction work on Head Works and distributories should go on paripassu. Taking up of new projects should be linked to completion of ongoing schemes.

Chapter IV

Review of the Existing Mechanism of Control Boards with regards to funding and implementation of inter-state Project and suggest appropriate measures for resolving such problems including provision of inadequate outlay.

1. There are 14 inter-State projects at different stages of construction. There is generally a differing and unequal interest of the party States to contribute their share of cost. For timely completion of these projects, it will be necessary to provide special Central Assistance in the form of matching grant for which a provision of Rs. 5,000 crores is proposed in IX Five Year Plan. This Central Assistance would cover other important projects also.
2. The Working Group recommends that an inter-ministerial committee under the chairmanship of Secretary, MOWR, Govt. of India will decide the modalities of funding of Central Assistance to different States as well as review the projects priority.

Chapter V

Basinwise Water Resources Development Plan

1. All the States / Union Territories to set up multi-disciplinary units for preparation of river basin master plans.
2. State / Union Territories to prepare river basin Master Plans for the portion of river basins falling in their territory.
3. River basin organisations may be set up in selected river basins e.g. Narmada, Bhramaputra, Ganga, Mahanadi, Godavari, Krishna, Cauvery & Subernrekha.

Chapter VI

Strategy & Measures for Improving the Efficiency of Existing Irrigation Systems

1. Performance evaluation of Projects be carried out before formulating modernisation schemes.
2. For turning over the minor level systems to Farmers' Associations, system should be in reasonably good shape and running conditions.
3. Adoption of other modern methods like sprinkler and drip, separately and in integration with surface system may be considered in the modernisation proposals.
4. Alongwith following the guidelines for preparing modernisation projects, preparation of operational Plans and PIM should be included in modernisation projects.
5. Rehabilitation / Restoration of projects may form part of modernisation. The aspects to be included in modernisation proposal are - selective lining, restoration of dams / headworks and canal systems, (Participatory Irrigation Management (PIM), review of cropping pattern, use of plastics, conjunctive use of surface and ground water, drainage and use of sprinkler / drip etc.
6. Rotational water supply system with suitable operation or scheduling needs to be followed for equitable distribution. For equitable distribution PIM should be ensured.
7. WRCP's may be taken up in other States. NWMP should be adopted and extended in IX Plan.

Chapter VII

Review of O&M and Water Rates and Peoples' Participation in Irrigation and Management

1. Project Authorities should adopt an O&M cost norm of Rs. 300 per ha. for utilised potential and Rs. 100 per ha. for unutilised potential as suggested by the 10th Finance Commission.
2. Full O&M cost of irrigation system should be recovered in phased manner i.e. next five years starting from 1995-96 taking into account the inflation rate also.
3. State Governments shall initiate appropriate action to enhance the water rates to cover 1% of capital cost in addition to achieving O&M cost fully. For this, the mechanism for collection need to be streamlined.
4. CWC, while carrying out the monitoring exercise on the implementation of the project, may ensure that the amount as proposed in the project reports towards O&M cost are actually spent by the project authorities. CWC should undertake a systematic and comparative study of existing norms and actual situation on the ground in all the major States. A state level high powered autonomous board i.e. Irrigation and Water Pricing Board may review the policy on maintenance cost including staff costs. There should be mandatory review of all these matters every five years.
5. State Governments should follow strict financial discipline with regard to non-plan expenditure earmarked for major and medium irrigation projects. The 10th Finance Commission has recommended that the Comptroller and Auditor General of India should constitute a Task Force to identify lapses from the prescribed norms and procedures and initiate corrective action. It is also recommended that a high powered committee chaired by the Chief Secretary and with secretaries of State Governments concerned should review every quarter the allocation and utilisation of funds provided for maintenance.
6. State Government may concentrate on maintenance of main water distribution system leaving the sub-distribution systems to Water Users Associations in order to reduce cost on staff and for better farmers / users participation and for better water management.
7. The features of WRCP projects specially of Orissa may be considered by other states in enlisting farmers' participation and as a model of self financing project.

Chapter VIII

Strategies for implementation of the Plan Based on Malady - Remedy Analysis including Personnel Policies

1. Construction programme of projects should be planned on 5 years basis to take up dam, canal and distribution system work simultaneously both in physical and financial terms so that the partial completion is achieved in all respects and benefits start accruing.
2. Land acquisition proceeding are time taking and generally delay the construction. The States should review land acquisition Acts, make them more simple and authorise Lok Adalat to settle the issues. Separate cadre of Land Acquisition Officers within Irrigation Department will help expeditious acquisition work to suit the priorities of the Departments.
3. Every State should have a consistent Rehabilitation and Resettlement (R&R) policy finalised in consultation with Project Affected People (PAP). Project construction should include implementation of R&R to ensure its completion paripassu with the dam and canal system.
4. Broad operation plans for the project should be designed with the involvement of farmers before it is put up for techno-economic clearance. Land consolidation is necessary for implementing the operational plans and efforts in this direction may be continued by State Governments.
5. Project Control Boards with statutory powers to sanction the estimates, awards of tenders and take decision on all project related issues may be set up to tide over the coordination problem between various agencies like Finance, Forest, Revenue, Electricity Boards and Agriculture Department. For mega projects independent corporation or Nigams could be set up.
6. The contractual problem like abandoning of work, dispute for rates, slow progress and arbitration etc. consume good deal of time. Measures to avoid them may be taken. The standard contract clauses need to be reviewed and suitable amendments effected to make them workable. Standardized contract documents may be evolved, if necessary, through the Bureau of Indian Standards for major river valley projects.

7. Budget provision for projects may be made by States as per outlays approved by Planning Commission and full allocation placed with the project authorities so that construction activities could be planned accordingly in advance. However, LOC can be released at regular intervals. Separate Plan funds for maintenance works during the construction phase of the project need to be provided and made available to construction agencies to avoid deterioration of completed works.
8. Any type of project needs time to achieve its full production potential. The process takes place in phased manner and depends upon several other factors. Similar is the case with major and medium irrigation projects. The need for food production would increase at a faster rate than the increase in potential utilised. It will be necessary to create simultaneously additional irrigation potential by taking up new projects in accordance with the specific needs of the States. For this, the States may also prepare plans in 20 years perspective prioritising the new projects.
9. Review of current definitions of various categories of Irrigation Projects viz. major, medium and minor may be considered by the 3rd Irrigation Commission.
10. The problem of waterlogging/salinity may be studied projectwise for taking up remedial measures. Irrigation by flooding is one of the reasons for the problem and over-irrigation could be checked by creating artificial scarcity of water by releasing less quantity of water for the same command area. The farmers can be educated to use optimum water needed for different crops and also encouraged to use ground water to check waterlogging.
11. Supply of irrigation on volumetric basis will lead to economic use of water and will also be advantageous to rotational water supply (RWS). Effective communication system for timely release of required quantity of water may be installed and gradually replaced by canal automation in large projects. Installation of water measuring devices like weirs, V-notches, partial flumes, constant head orifices & automatic gauge recorders in the canal and distribution system will be useful to monitor quantity of flow and detect loss of water due to various reasons including unauthorised drawals. The State Govt. may also consider to make theft of water a cognizable offence.

12. Regular evaluation of the performance of irrigation projects may be carried out to determine the system deficiencies and the impact of the project. Data on actual irrigation vis-a-vis designed CCA should be collected annually and also seasonally. The studies should cover peak flood, replenishment of reservoir, waterlogging/salinity, on-farm development, reservoir siltation, cropping pattern and yearly efficiency of irrigation system.
13. The project engineers should not be frequently transferred to maintain continuity in the tempo of work. Vacant posts should be filled up and motivated, dedicated and dynamic officers may be posted at the projects. Some incentives like bonus and additional increment may be announced for early completion of the project than the schedule date to generate momentum among the staff. In order to attract qualified and best talent for research work, the officers posted in Research Institutes / WALMIs may be given higher pay / special allowance.
14. The stagnation of officials at various levels is the cause of frustration and low output. As already adopted by some States, the system of time scale could be introduced by all States so that if not the rank at least financial hardship is taken care of.

Chapter IX

Measures for Improving Statistical Data Base, Planning Design & Monitoring Capability both at State & Centre for Irrigation Development on Sustainable Basis

1. Recommendations of the Working Group in 1983 on "Guidelines & Methodology for Collection & Reporting of Data on Potential Created & Area Irrigation from Major, Medium and Minor Irrigation Schemes" may be implemented by the State Governments. State level, district level and Project/Block level committees may be constituted comprising of representatives from State Irrigation, Agriculture, CAD, Revenue, Land Records and Economics / Statistics Departments. The work of these committees may be coordinated by senior administrative authority at each level so that the inconsistencies in data are reconciled at the source itself. The data so generated should be treated as authentic and used by all the State and Central organisations.

2. Like minor irrigation, the major and medium irrigation projects should also be brought under the purview of similar census operation. This will bring out the inter-dependence of the different systems and the extent to which these are complimentary to each other.
3. National level, State level and district level data banks may be set up on water availability in time and space (hydrological data), water utilisation in different crop seasons, commandwise cropping pattern, flood related information and other meteorological parameters. The NICNET facilities available upto district level may be used for interactive transmission of information.
4. With complexity of development and competitive demands for various uses, it is more likely that hazards associated with water environment are inadequately regarded. Planning must take into account the carrying capacity of the river system with emphasis on sustainability. Detailed master plan will help picking up the most need projects out of many available options for the well being of the society. The State Planning Departments may provide necessary policy directions and make institutional arrangements for selection of projects on this principle to make better use of the available resources.
5. Use of inadequate and unreliable data has an inherent risk of faulty planning, design, delay in construction, cost over run and above all project failure. The laid down guidelines, procedures, standards, BIS Codes and Practices have to be followed for collection of data and geological investigations. Most of the States have separate project planning and investigation unit, which should be suitably strengthened. Those which do not have, should set up such organisations / units. These units should have the latest equipment, technology and laboratory testing facilities with trained manpower.
6. The design organisations have important role to play at project investigation as well as during project construction and monitoring stages. Regular interaction among investigation, design, construction and monitoring organisations of the project is necessary for evolving suitable strategies in appreciation of each others requirements. These project organisations should also remain in regular touch with Central Water Commission for exchange of expertise and follow the established guidelines.
7. The monitoring mechanism in the States should be very effective to identify the progress, deficiencies, slippages, their causes and suggest remedial measures.

Selective and specific monitoring by Central Organisations like CWC should help project authorities to deal with the issues arising out of reasons outside the latter's purview. Similar monitoring procedures & formats should be used by State as well as Central organisation to generate compatible data base at various stages of the project. It will be mandatory on the part of project authorities to comply with the findings and suggestions of the State/Central monitoring organisations within a reasonable time frame.

Chapter X

Mobilisation of Adequate Resources for the Sector

1. To meet the full requirements of the major and medium irrigation sector an outlay of about 10% of the total plan outlay may be provided depending upon the overall size of the IX Five Year Plan.
2. Weightage of 10% for ongoing major irrigation projects as Central assistance to States may be given and the release of such funds may be linked with the States meeting their own commitments in regard to the allocation of resources to this sector.
3. The irrigation receipts should cover not only O&M Costs but also give a return of at least 1% per annum on capital.
4. Expansion and extension of Rural Infrastructure Development Fund (RIDF) set up in NABARD is suggested. The investments in the major projects which are in advance stage of construction will deliver goods in a big way by creation of additional irrigation potential.
5. The other measures like-integrating Rural Development Programme with irrigation sector, increased role of Water Users' Associations/Farmers' Organisations to manage the systems and meet O&M cost, introduction of water bonds or equity shares, commercial exploitation of land on the embankments of irrigation projects, continuing multi-lateral and bi-lateral assistance, re-structuring of organisations and make them management-oriented, borrowings from the market etc. may also be resorted to reduce pressure on public funding.
6. Keeping in view the trend of liberalisation policy and the steps already taken in other sectors of the economy, it is felt that in addition to the governmental efforts, private sector participation in irrigation and multi-purpose projects should be encouraged. Private invest

ments in this sector may initially be on a pilot basis in respect of certain projects in specific regions. Various combinations of buildings, owning (of structures etc.), operating, leasing and transferring projects to the private entrepreneurs may be considered.

Chapter XI

Employment Generation, Training & Career Management

1. A study on direct employment carried out during 1995 shows that weighted average employment from construction of major & medium projects works out to 133 person years per crore of rupees. In case of operation, maintenance and repair (OMR) the employment generated per thousand ha. is 4.74 person year. With these norms, the direct employment generation during IX Plan is likely to be 2.61 million person years (2.46 from construction and 0.15 in OMR).
2. The norms for indirect employment comprising of on-farm employment, live stock sector employment and rural non-farm employment are 50 person days per ha., 10 person days per ha. and 25 person days per ha. of irrigated farming respectively. The indirect employment potential is expected to be 6.1 million person years (3.60 million in on-farm, 0.70 million in livestock and 1.8 million in non-farm activities).
3. The additional employment of rural labour in agriculture supported by major and medium irrigation projects at the rate of 85 person days per ha. works out to 9.65 million person years per year.
4. The irrigation sector is highly inter-disciplinary in nature and technological developments are taking place at a fast rate. In order to improve, motivate and update the skill of engineers, technicians and sub-professionals, specialised training courses in selected fields may be organised for each level.
5. Few regional centers may be gradually developed in the country for State-of-the-art training activities of world class.
6. Besides national level institutes, the training programmes at State level for field functionaries would be more effective and useful. The WALMIs and Irrigation Research Institutes should expand their training programme. The IITs and Engineering Colleges may also be associated with refresher courses at two stages with 10-15 years interval.

Chapter XII

Science & Technology Plan for the Irrigation Sector so as to evolve a suitable S&T Programme

1. The Science & Technology Programme requires streamlining for extending the R&D activities to identified thrust areas. The Science & Technology Advisory Committee (STAC) may evolve systematic R&D Programme and invite research proposals from Research Institutes / WALMIs / Universities with twin objectives of new breakthrough and timely dissemination of the research output.

Chapter XIII

Follow up action taken on the recommendations of the Public Accounts Committee made in Report (Tenth Lok Sabha) & Recommend such changes in context of the Irrigation Development Programme for the Ninth Five Year Plan

1. Organisations should formulate a realistic work programmes and vigilant monitoring of various check points should be used to ensure that the work progresses as per schedule. The active involvement and participation of the State Government / Department should be a prerequisite for the purpose. The monitoring mechanism can be at different levels such as Ministry of Water Resources, Planning Commission, State Government etc. Necessary measures to obviate bottlenecks in carrying out the work, if any, should be taken at appropriate time through co-ordinated efforts.
2. In order to ensure prompt after sale service / maintenance, it would be preferable to use indigenous equipment manufactured and serviced by reputed firms. Import of equipment should be resorted to only in unavoidable and exceptional cases where the equipment is not available indigenously or it becomes binding under conditions of external funding agencies. In any case, repair and maintenance of the equipment should be responsibility of the suppliers or their agents. Specific provisions to this effect should be made in the Warrantee / Maintenance agreement with the supplier. The performance of sophisticated / major equipments shall also be monitored continuously for ensuring optimum utilization.

Chapter XIV

Creation & Utilisation of Irrigation Potential

1. MOWR may report only the figures of potential created to indicate the building up of infrastructure.
2. Ministry of Agriculture may collect and report the statistics of utilisation of irrigation potential.
3. If 90% of the potential created is utilised in a project, it should be considered as satisfactory.
4. The lag in potential created and utilisation may be due to change in cropping pattern, systems deficiencies, poor water management etc. A joint committee of officials from irrigation and agricultural departments should be constituted to look into the causes of the lag and suggest remedial measures.
5. In case of projects where the potential utilised is less than 75% of potential created the critical review to identify the causes and shortfall may be undertaken to take remedial measures on priority basis.
6. The review of definition of potential created/utilized should be referred to 3rd Irrigation sommission recommended to be set up by the Working Group.

INTRODUCTION

- 1.1 The Planning Commission vide its order no 25(1)/A/96-I&CAD dated 31.10.95 constituted a Working Group under the Chairmanship of Secretary, Ministry of Water Resources with Member(WP&P), CWC as the Member-Secretary for formulation of Major & Medium Irrigation programme for IX Five Year Plan. The Working Group had originally 27 Members including the Chairman, 9 representatives from State Governments and 4 non-official members. Later 3 Members and 1 Special invitee were included in the Working Group by the Planning Commission vide its letter of even no dt 5.1.96, 6.2.96, 14.2.96 & 17.4.96. All the letters of the Planning Commission are placed at Annex I(1).
- 1.2 The terms of reference of the Working Group briefly covered the following aspects:
- i) Review of performance of VIII Five Year Plan in terms of physical and financial targets.
 - ii) Formulation of proposals for IX Five Year Plan for each State as well as the Central sector.
 - iii) Review of existing mechanism of Control Boards and suggest appropriate measures for ensuring adequate outlays for inter-state projects.
 - iv) Drawing up of basin-wise land use perspective plans and Water Resources Development Master Plans before the end of IX Plan.
 - v) Strategy & measures for improving the efficiency of existing irrigation system including modernisation/renovation of old irrigation projects.
 - vi) Review of operation and maintenance and Water Rates including People's participation in Irrigation Management.
 - vii) Strategies for implementation of IX Plan based on Malady Remedy analysis.
 - viii) Measures for improving the Statistical Data Base.
 - ix) Mobilisation of adequate resources for the sector.
 - x) Employment Generation and Training.
 - xi) Science and Technology plan for Irrigation Sector.
 - xii) Follow up action on the recommendations of Public Accounts Committee.
- 1.3 The first meeting of the Working Group was held on 11th Jan, 1996. As decided in the meeting, four sub-groups as detailed hereunder were constituted to study and make recommendations on TOR (vi), (viii), (x) & (xi):

: 2 :

Sub-group on TOR(vi) related to "Irrigation Efficiency & Modernisation" with Sh S.T.Deokule, Former Prl Secretary, Irrigation, Government of Maharashtra as the Chairman.

- Sub-Group on TOR (viii) related to "Malady Remedy Analysis" with Sh J.F.Mistry, Former Secretary, Irrigation, Government of Gujarat as Chairman.
- Sub-group on TOR (x) related to "Mobilisation of Resources" with Sh Hanumantha Rao, Former Member, Planning Commission as the Chairman.
- Sub-group on TOR (xi) related to "Employment Generation & Training" headed by Sh Basawan Sinha, Former Engineer-in-Chief, Water Resources, Govt of Bihar.

1.4 Office memorandum no.8/10/95/P&P/53-92 dt 19.1.96 and no 8/10/95-P&P/285-294 dt 9.2.96 giving the composition and terms of reference of sub-groups are placed at annex I(2). The reports of all sub-groups were discussed in Working Group meetings and are included as chapters in the report.

1.5 All the State Governments & UTs were requested to furnish information regarding performance during VIII Plan and proposals for IX Plan in the prescribed proforma vide CWC letter No.8/10/95-P&P/273-300 dt 27.12.95 and subsequent reminders.

1.6 Chapters on "Performance of VIII Plan" and "Size for IX Plan" were prepared by incorporating the information in respect of States from where the same was received. In respect of State from where the information was not forthcoming the financial & physical achievements during VIII Plan, the spillover cost & benefits into IX Plan, the proposed outlay & physical targets for IX Plan etc were worked out/fixed based upon the information available in CWC and certain assumptions as detailed in respective chapters. For all other TOR the chapters were prepared with the assistance of various officials of CWC.

1.7 In all three meetings of the Working Group were held. The 2nd meeting of the W.G was held on 27th Feb,96. The 3rd and final meeting of the Working Group was held on 13th May,1996 wherein the draft report of the Working Group was discussed. All the Members were requested by the Member - Secretary to send their comments/suggestions, if any, on the draft report for consideration before finalising the report of the Working Group. The Members from Govt of Gujrat, Karnataka, Bihar, Rajasthan and U.P furnished their views/suggestions subsequently. Based on the decision taken during the third meeting of the Working Group and subsequent suggestions made by the Members, the report was finalised.

CHAPTER I

BRIEF REVIEW OF THE OVERALL PERFORMANCE OF MAJOR & MEDIUM IRRIGATION

1.1 Ultimate Potential

Irrigation Commission(1972) has assessed the ultimate irrigation potential of the country as 113.5 million hectares comprising 58.5 mha by major & medium irrigation schemes, about 15 mha by minor surface water schemes and about 40 mha by ground water. Indications are that the ultimate potential through minor surface irrigation could be 17 mha & ground water potential 64.5 mha taking the ultimate irrigation potential to 140mha. However ultimate potential through major & medium projects remains unchanged at 58.5 mha. With the inter-basin transfer of water in future the ultimate potential in the country will further go up. On the other hand the experience of some of the completed projects shows that the potential which was earlier envisaged is unlikely to be achieved. In fact, in some of the major projects, the States have now reported that the ultimate potential of these projects is likely to be less than what was originally envisaged. Therefore, from the VI plan onwards, the Govt. of India have been requesting the states to carry out project-wise reassessment of the ultimate potential. Importance of reassessment was also brought out in the Annual Conference of the Irrigation Ministers. However, this exercise has yet to be completed by the the States.

The Working Group constituted for the preparation of the Major and Medium irrigation for the VIII Plan (1990-95) stated in their report that although this ultimate potential is likely to be changed, at present, it should continue to stand at 58.5 m.ha. The position has remained unchanged during the course of the VIII Plan.

In order to have a firm base for the formulation of the IX and subsequent Plans, it is necessary to reassess the ultimate potential. While the Working Group again emphasises upon the States to carry out and complete this exercise before the end of the IX Plan, the review as well as the future perspective is being based on the existing figure of 58.5 million ha.

Working Group also recommends setting up of 3rd Irrigation commission to interalia review the Ultimate Irrigation Potential in the country from various sources as also the irrigation potential created & utilized.

1.2 Progress in the creation of additional potential through various plans:

Before the commencement of the planned era, irrigation potential created through major & medium irrigation was 8.65mha. During the period 1951-92 additional potential created was 22.09 million ha. thus making a cumulative irrigation potential of 30.74 m.ha. During the VIII Plan, although the original target of

creation of additional irrigation potential was 5.09 million ha., the present assessment indicates that the actual achievement is likely to be of the order of 3.08 mha. The figure has been worked out on the assumption that 1995-96 and 96-97 targets would be the same and would be fully created. Thus, at the end of VIII Plan, the total irrigation potential created through major and medium irrigation will be 33.821 mha which works out to 58% of the ultimate irrigation potential of 58.5 million ha. This figure will form the basis for the future planning including that of IX Plan. At the beginning of the VI Plan, it was envisaged that the ultimate irrigation potential in the country will be achieved by the turn of the century. In the beginning of the VII Plan, the target year for full development of ultimate irrigation potential was projected as the end of the Tenth Plan, i.e. 2005. At the start of VIII Plan the target date for full development of irrigation was shifted to 2015.

While the above position is applicable for the country as a whole, the position in various States is considerably different as given under.

**MAJOR & MEDIUM IRRIGATION
ANTICIPATED ACHIEVEMENT UPTO END OF VIII PLAN**

Sl. States/UTs	Ult. Irr. Pot.	Ach to the end of A/P 91-92	Addl Ach. dur. 8th Plan (Anti)	Total Ach to end of 8th Plan (Anti)	% of Deve. at th end o 8th Plan
1. Andhra Pradesh	5000	2999	355	3354	67
2. Arunachal Pradesh	-	-	-	-	-
3. Assam	970	176	44	220	23
4. Bihar	6500	2766	160	2926	45
5. Goa	62	13	1	14	23
6. Gujarat	3000*	1246	143	1389	46
7. Haryana	3000	2035	58	2093	70
8. Himachal Pradesh	50	8	1	9	18
9. Jammu & Kashmir	250	158	17	175	70
10. Karnataka	2500*	1377	397	1774	71
11. Kerala	1000	416	214	630	63
12. Madhya Pradesh	6000	1962	351	2313	39
13. Maharashtra	4100	2030	266	2296	56
14. Manipur	135	59	32	91	67
15. Meghalaya	20	-	-	-	-
16. Mizoram	**	-	-	-	-
17. Nagaland	10	-	-	-	-
18. Orissa	3600	1409	137	1546	43
19. Punjab	3000	2367	138	2505	84
20. Rajasthan	2750*	1999	304	2303	84
21. Sikkim	20	-	-	-	-
22. Tamil nadu	1500*	1545	7	1552	100
23. Tripura	100	2	-	2	2
24. Uttar Pradesh	12500	6806	277	7083	57
25. West Bengal	2310	1353	174	1527	66
Union Territories	98	15	4	19	19
Total	58475	30741	3080	33821	58

* States have indicated that the actual would be more

** included in UT

From the Statewise position given above, it would be observed that out of the major 16 States, six States would have already achieved 70% or more of the ultimate irrigation potential by the end of VIII Plan. The leading State is Tamil Nadu with 100% followed by Punjab & Rajasthan at 84%. Six States viz. A.P., Haryana, Karnataka, Jammu & Kashmir, Kerala and West Bengal would achieve between 63% to 71%, whereas in the States of Uttar Pradesh and Maharashtra it would be 57% & 56% of their ultimate potential. The States of Bihar, Gujarat, Orissa, M.P. and Assam where the achievements are likely to be even less than 50% of the ultimate potential, will have to go a long way to harness their full ultimate potential.

Each State should have its own Perspective Plan for full development of balance potential spreading over the required number of years(not exceeding 20 years), keeping in view the availability of funds and infrastructure. On integrating Perspective Plans of all the States, a clearer picture of full development of the ultimate potential would be available.

1.3 Cost of creation of Irrigation Potential:

On account of the price escalation, particularly from the Seventies onwards, the cost of creating irrigation potential has been continuously rising. If the expenditure incurred in any of the Plans and the potential created in that Plan is taken into account the cost of creation of the irrigation potential over different time-spans works out as indicated in the following table:

Plan Period	Expen. (Rs. crores)	Poten. created (in m.ha.)	Cost per Ha. of irrigation potential created (At current prices)
First Plan	376	2.50	1200
Second Plan	380	2.10	1810
Third Plan	576	2.30	2526
Annual Plans(66-69)	430	1.50	2893
Fourth Plan(69-74)	1242	2.60	4758
Fifth Plan(74-79)	2516	4.02	6075
Annual Plans(78-80)	2079	1.88	10940
Sixth Plan(80-85)	7369	3.41	21610
Seventh Plan(85-90)	11107	2.22	50000
Annual Plans(90-92)	5459	0.82	66570

However, this comparison is strictly not correct as part of the investment has not resulted in creation of potential due to non-completion of some works although minor in cost. If the cost per hectare is worked out on the basis of constant prices with 1980 as the base, the picture becomes considerably different. The position that emerges is as below.

Plan Period	Expen. (Rs. crores) at constant price 1980-81 base =100	Poten. created (in m.ha.)	Cost per Ha. of irrigation potential created (at const- ant prices) (1980-81)
First Plan	2154.9	2.50	8619.6
Second Plan	1950.7	2.10	9289.0
Third Plan	2366.5	2.30	10289.0
Annual Plan(66-69)	1246.9	1.50	8312.7
Fourth Plan(69-74)	2875.7	2.60	11060.0
Fifth Plan(74-79)	3647.7	4.02	9073.8
Annual Plan(78-80)	2852.9	1.88	14111.0
Sixth Plan(80-85)	6401.0	3.45	18771.0
Seventh Plan(85-90)	7003.2	2.225	31475.0
Annual Plan (90-92)	2426.1	0.82	29587.0

Even the above table gives a rising trend of cost after the end of the Fifth Plan period. There have been some valid reasons for this increase in cost even at constant prices. Some of the main reasons are as follows.

- a) In the earlier projects, the distribution system was terminated at 40 ha blocks. However, from the middle of the 6th Plan, as per decision of the Govt. of India, the distribution system is now constructed at the project cost upto 5-8 ha. block.
- b) In most of the earlier irrigation projects, no provision for drainage was made which now is an integral part of the irrigation projects.
- c) From the Fifth Plan onwards, in most of the States, a number of new projects were taken up resulting in thin spreading of limited available financial resources. This resulted in considerable time over-runs and consequently cost over-runs. Even in the VIII Plan, the same position continues and in some projects, the annual allocations available mostly met the establishment costs and annual escalations and very little of the capital works.

- d) Even in the VIII Plan, there were some projects continuing from the First and Second Plans, although these are virtually completed. In these projects, possibly the annual maintenance charges are being debited to the capital costs.
- e) After the introduction of external financial assistance, there is growing tendency to resort to lining of main canals and distribution systems which considerably adds to the overall project cost.
- f) Progress on a number of major and medium irrigation projects has been severely affected due to non-availability of Forest Lands for construction of important parts of the projects. This has resulted in idle investment and in non-creation of irrigation potential, though substantial investments have been made in such projects.
- g) Cost of rehabilitation & resettlement has increased considerably in recent years.

1.4 Proliferation of Schemes:

The number of major and medium schemes which were taken up in various plan periods is given below:

Plan Period	Major	Medium
First Plan	44	169
Second Plan	33	102
Third Plan	32	44
Annual Plans(66-69)	11	30
Fourth Plan(69-74)	32	73
Fifth Plan(74-79)	70	300
Annual Plans(78-80)	13	52
Sixth Plan(80-85)	30	91
Seventh Plan(85-90)	12	33
Annual Plans(90-92)	1	-
Eighth Plan(92-97)	14	50
Total	292	944

It will be observed from the above table that the major distortion came into play in the Fifth Plan(1974-1978) when 70 new major schemes and 300 new medium schemes were taken up. This has to be considered in the background that, when the Fifth Plan started in 1974, 97 major and 130 medium schemes were already under construction. Their total estimated cost was of the order of 4842 crores with an ultimate potential of 14.58 m.ha. Their spillover cost into the Fifth Plan was Rs.2902 crores and the balance potential yet to be created was 9.563 million ha. The total Fifth Plan investment was Rs.2442 crores which was not adequate even for the completion of the major and medium schemes which were ongoing and had spilled over into the Fifth Plan.

The cost of new major projects taken up in the Fifth Plan itself was Rs.8136 crores. It may also be worth noting that this was roughly the period when major escalation in prices took place. Inspite of this position, 30 major and 91 new medium schemes were taken up in the Sixth Plan. Thus, at the beginning of the VIIIth Plan, the scheme which were under construction had a spillover cost as high as about Rs.40563 crores.

This state of affairs resulted in thin spreading of resources with consequent time and cost over - runs.

The position of completion of major and medium schemes upto the beginning of IX Plan will be as under.

Major schemes	158(including 38 projects likely to be completed during 8th Plan)
Medium schemes	768(including 100 projects likely to be completed during 8th Plan.

From the VI Plan onwards, and particularly in the VIII Plan, emphasis was given for completion of as many ongoing projects as possible. During the IX Plan also the same trend will have to be continued.

CHAPTER II

PERFORMANCE OF THE VIII PLAN

2.1 Financial and Physical Performance

The Working Group for the formulation of draft VIII Plan (envisaged for 1990-95) for Major and Medium irrigation was constituted by the Planning Commission in October, 1988. After holding 5 meetings the working Group recommended in June 1989 an outlay of Rs. 24963 cr. for VIII Plan. This outlay constituted Rs. 16914 cr. for ongoing projects and Rs. 3294 cr. for new schemes.

The commencement of VIII Plan was delayed by two years. The final outlay for VIII Plan (1992-97) was earmarked as Rs. 22415 cr. with the target of creating an additional potential of 5.088 million ha. The broad distribution of the outlays were as under:

Sl. No.	Description	Rs. Crores	Percentage of total outlay
1.	Major ongoing Projects	15054.00	67.2
	Medium ongoing Projects	1581.00	7.0
	E.R.M. ongoing Projects	1789.00	8.0
2.	New Projects	2019.37	9.0
3.	National Water Management Projects	348.70	1.6
4.	Dam Safety	450.11	2.0
5.	Survey & investigation, R&D and Admn.	139.65	0.6
6.	Water Development	937.70	4.2
	Total States	22319.53	99.6
	Central Sector	95.00	0.4
	Grand Total	22414.53	100%

Source :- VIII Plan document of Planning Commission

The Performance during the first four years of the Plan is as under:-

Year	Expenditure (Rs. Crores)	Additional Potential created (M. Ha.)
1992-93	3015	0.387
1993-94	3685	0.473
1994-95	3570 (Anticipated)	0.672 (Anticipated)
1995-96	5068 (Outlay)	0.770 (Target)

It will thus be observed that while the expenditure during the first three years of the Plan is about 46% of the total Plan outlay, the creation of additional Potential is 30% of the physical target.

The outlays for the last year of the VIII Plan are not available as the Annual Plan 1996-97 discussions for states have been deferred by the Planning Commission. The likely estimated expenditure in the VIII Plan would be of the order of Rs.20,720 crores which includes escalation. The statewide position of Financial and Physical Performance is given in Annexure-II(1).

It will be observed that while some of the major states viz-Andhra Pradesh, Karnataka and Maharashtra are likely to incur more expenditure than the approved outlays, five major states as detailed below are likely to have appreciable shortfall in the expenditure, and in other states the expenditure will be more or less same as the outlays.

States	Approved Outlays (Rupees crores)	Anticipated Expenditure	Expenditure as % of outlays
Bihar	1927.17	1100.64	57
Gujarat	3426.00	2465.75	72
Madhya Pradesh	1791.29	1444.01	81
Orissa	2614.33	916.02	35 - ?
Uttar Pradesh	2599.34	1674.97	64

The Working Group recommends that states should provide adequate funding for major and medium irrigation sector commensurate with the approved outlay by the Planning Commission.

Out of the 16 major states as many as nine will have shortfall in physical achievements as indicated below:-

States	Target (Th.Ha)	Shortfall in (Th.Ha.)	Physical achievements % of shortfall
Assam	120	76	63
Bihar	315	155	49
Gujarat	448	305	68
Haryana	296	238	80
Madhya Pradesh	450	99	22
Maharashtra	400	134	34
Orissa	334	197	59
Punjab	176	38	22
Uttar Pradesh	976	699	72
Total		1941	

Nearly 2.0 million ha.

This slippage of 1941 th. ha. is against VIII Plan overall assessed slippage of 2008 th. ha. from target of 5088 th. ha to likely achievement of 3080 th.ha for the country as a whole.

Similar slippage had occurred during VII Plan also where the additional potential created was 2.225 m. ha. against the target of 4.3 m.ha. Major reasons for slippages continued to be generally same viz. thin spreading of resources, inadequate funding for the projects, increase in cost of land, increase in rehabilitation and resettlement costs, non-completion of essential distribution of infrastructures, land acquisition bottlenecks, forest clearance delays, etc.

2.2 COMPLETION OF PROJECTS

The Working Group for VIII Plan in its report had analysed during 1989-90 and had estimated that out of 176 major schemes, 109 would be completed during VIII Plan. Similarly, out of 283 medium projects, 253 would be completed. The completion of ERM Projects was not discussed because they mainly attribute to stabilisation of projects and do not add much to potential. The criterion for completion of these projects, the entire spillover cost of 109 major and 253 medium projects, as assessed at the beginning of the Plan, was recommended to be fully provided for. However, due to changed political situations in the country the period 1990-92 was converted into two annual plans, thus shifting the VIII Five year plan to 1992-97. And at the time of actual formulation of VIII Plan, outlays equivalent to their spillover cost was made for 80 major and few medium projects only by the Planning Commission. These amounts were inadequate, as the outlays did not provide for the escalation during the Plan period. The midterm review carried out by Planning Commission in November 1994, revealed that only 57 major and 166 medium irrigation projects would be completed during the VIII Plan period. Now it is anticipated that only 38 major, 100 medium and 45 ERM project are likely to be completed during VIII Plan in addition to 6 major projects which were not originally identified for completion. The status of 80 major schemes targetted for completion with their spillover costs at the begining and estimated spillover cost at the end of VIII Plan are given at Annexure II(2). It can be seen from the statement that 20 % of the schemes not only missed the targetted completion, but increased in the spillover costs at the end of VIII Plan. List of such schemes is given as under:

S.No.	Name of Project	<u>Spillover Costs (Rs. Crores)</u>	
		<u>Begining of</u> VIII Plan	<u>End of</u> VIII Plan
1.	Sriram Sagar	363	493
2.	Singur	15	40
3.	Srisaillam RBC	440	641
4.	Nagarjuna Sagar	76	121
5.	Dhansiri	15	81
6.	JLN Lift	6	22
7.	Karanja	38	99
8.	Kanhirapuzha	10	29
9.	Mahi	74	84
10.	Bhatsa	46	182
11.	Tillari	20	215
12.	Jayakwadi	143	430
13.	Thoubal	72	83
14.	Upper Indravathi Irrigation	256	351
15.	Lakhwar Wyasi	194	203

The increase in spillover cost is mainly because of revision in the estimated cost of the projects due to various factors including change in scope from time to time, non-provision of annual outlay proportionate to VIII Plan outlay, funding rate not covering even the escalation due to inflation.

In order to contain this trend, the Working Group recommends that the frequent changes in scope of the projects should be avoided. In the event of major changes in the scope as per works, State Govt should prepare and submit the Revised D.P.R. on guidelines of CWC for techno economic appraisal and subsequent investment clearance of the Planning Commission.

Working Group also emphasises that annual rate of funding should be proportionate to Plan outlay and should cover the inflation cost.

It is also seen from the statement that there are number of projects for which the latest estimated costs have not been either revised or indicate slight changes during the four years of the VIII Five Year Plan. These projects are as under:

S.No	Name of Project	Estimated Cost Rs. Crores
1.	Western Kosi Canal	357
2.	Durgawati Project	147
3.	Ajay Barrage Siktia	133
4.	Gumani Barrage	58
5.	Dhakranala P.C. scheme	80
6.	Sindh Warni	22
7.	Jonk	46
8.	Gandak Canal	159
9.	Gurgaon Canal	33
10.	Sarda Sahayak Canal	1065
11.	Sone Pump Canal	73
12.	Gyanpur Pump Canal	112

There is every likelihood that number of such schemes would fall under similar pattern of spillover costs as mentioned in the preceding paragraph. It can be construed that thin spreading of resources as well as inadequate outlays for the projects have resulted in a precarious situation with respect to estimated programme for projects' completion during the VIII Plan.

The Working Group recommends that estimated cost for each project should be revised/ updated every year in order to reflect realistic spillover costs. The revised estimated cost should invariably be included in the State Annual Plan proposals.

A list of major projects which are likely to be completed in the VIII Plan is given at Annexure-II(3). Thus from 1951 upto the end of VIII Plan period a total of 158(120+38) major, 768(668+100) medium and 96(51+45) ERM projects are likely to be completed. The planwise position is depicted in the statement at Annexure II(3A).

2.3 POSITION OF SPILLOVER IN IX PLAN

In order to ascertain actual liability of spillover projects into IX Plan, a schemewise review of all ongoing and new projects taken up during VIII Plan was made. It has been found that expenditure less than 5% of their estimated cost is incurred in 12 Major and 6 Extension, Renovation & Modernisation schemes. These Projects are categorised as new schemes of IX Plan. A list of such projects considered as taken up in IX Plan is given in Annexure-II(4).

At the beginning of VIII Plan, there were 158 major, 226 medium and 95 ERM ongoing projects. However, for one major project in Bihar namely Masan Dam, the State Govt. have not proposed any outlay during VIII Plan. Hence this project is being treated as dropped. Similarly, two major projects viz. Kabini and Harangi and one ERM project viz. Varuna Canal (Krishnarajasagar R.B. Canal) in Cauvery Basin in Karnataka are not being provided plan funds. As such they are also being excluded from the list of ongoing projects under Plan programme. Thus, at present, there are 155 major, 226 medium and 94 ERM ongoing schemes. Accordingly, the number of projects spilling to IX Plan would be as under :

DESCRIPTION	MAJOR	MEDIUM	ERM
Ongoing in VIII Plan	155	226	94
Taken up in VIII Plan	~~148~~	~~50~~	~~24~~
Total	169	276	118
Likely to be completed during VIII Plan	38	100	45
Net	131	176	73
Considered as new projects of IX Plan	12	-	6
Spillover projects into IX Plan	119	176	67

@ List given at Annexure II(4A).

A break up of spillover Major projects indicating the plan period in which these were started is given below:-

II Plan	2	}	
III Plan	8	}	24 *
Annual Plan 66-69	2	}	
IV Plan	12	}	
V Plan	52	}	
Annual Plan 78-80	9	}	
VI Plan	18	}	95
VII Plan	4	}	
Annual Plan 90-92	2	}	
VIII Plan	10	}	
Total			119

* Two projects namely Kabini taken up in II Plan and Harangi taken up in III Plan in Cauvery basin excluded.

The total spillover cost of ongoing projects into IX Plan is given below:

	<u>Rs. Crores</u>
i. Major projects (119 Nos.)	35299
ii. Medium projects (176 Nos.)	2192
iii. ERM schemes (67 Nos.)	3781

	41272

(For details Table 1 of Chapter 3 refers)

2.4 DROUGHT PRONE AREAS

In all, 99 districts in 13 states of the country have been identified as drought-prone districts. These districts have a geographical area of 108 million ha. against the country's geographical area of 329 million ha. and culturable area of 77 million ha. against the country's culturable area of 185 million ha. Thus the drought-prone area constitute 33% of the geographical area and 42% of the culturable area of the country. Out of 158 major, 226 medium and 95 ERM on-going projects of VIII Plan, 63-major, 62-medium (excluding M.P. and Maharashtra) and 18-ERM projects envisage benefits to drought-prone areas.

The irrigation potential targetted to be created by these projects during the plan period was 2.09 million ha. which formed 41% of the plan target of 5.088 million ha. According to the present assessment, the likely achievement from them is 0.98 million ha. Following is the position in respect of States having more than 40% of their culturable area as drought-prone.

State	% of the culturable area as drought prone	VIII Plan target of potential (m.ha.) For whole state	In drought prone area	
			Target	Likely
Andhra Pradesh	48	0.419	0.20	0.17
Gujarat	79	0.448	0.327	0.113
Karnataka	87	0.401	0.349	0.34
Maharashtra	47	0.400	0.180	0.12
Rajasthan	66	0.288	0.190	0.20
Tamil Nadu	65	0.010	0.06	0.04

A list of irrigation projects catering to drought prone-areas is given at Annexure-II(5).

2.5 TRIBAL AREAS

The tribal population of the country constitutes about 6.9% of its total population. Besides the North-Eastern States, other States having sizeable tribal population are Madhya Pradesh (23%), Orissa (22%), and Gujarat (14%). In all 22 districts in 8 States and 2 Union Territories have been declared as tribal districts, i.e. districts with more than 50% of their population as tribals.

The Tribal Sub-Plan of VIII Plan covered 118 districts in 17 States and 2 Union Territories. The major and medium Irrigation projects identified under Tribal Sub-Plan are targetted to create an additional irrigation potential of 1.3 million ha out of the 5.088 million ha targetted in the VIII Plan. The likely achievement, however, would be 0.3 million ha. A list of irrigation projects catering to the tribal area is given at Annexure-II(6).

2.6 UNAPPROVED SCHEMES

Out of 158 Major Projects, 226 medium schemes and 95 ERM schemes ongoing during VIII Plan, as many as 45 major, 49 medium, and 72 ERM schemes are awaiting approval from Planning Commission or in various stages of appraisal. Similarly out of the 14 Major, 50 medium & 24 ERM schemes taken up during VIII Plan 13 major, 45 medium and 23 ERM schemes have not been approved by the Planning Commission. In the penultimate year of VIII Plan the financial position of unapproved ongoing schemes is as under.

	Rupees in crores			Total
	Major (45)	Medium (49)	ERM (72)	
Total estimated cost	19212	1862	4509	25583
Expenditure likely to be incurred to the end of VIII Plan	8833	750	1902	11485

As per the existing procedure, major schemes are scrutinised from techno-economic feasibility, interstate and international angles by the Central Water Commission, Central Ground Water Board & Water Management Division of the Ministry of Water Resources, Ministry of Agriculture, etc., and from Forests and Environmental angles by the Dept. of Forests and Environment. The rehabilitation and resettlement of tribal population are examined by the Ministry of Welfare. These are then considered by the Advisory Committee which, after examining the techno-economic viability, recommends the Projects for approval of Planning Commission. Department of Forests and Environmental issues separately clearance for the projects from Forests and Environmental angle. Thereafter, the Planning Commission accords requisite approval. The projects indicated as "unapproved" above are those for which approval from the Planning Commission has not yet been accorded.

There have been many cases where an expenditure of more than 75% has been incurred by the States on individual projects which were not approved by the Planning Commission. It is desirable that states should get the schemes approved by attending to the comments of appraising agencies, so that resources are gainfully utilised for techno-economical viable schemes.

However out of the above ongoing unapproved schemes 26 major, 13 medium & 6 ERM schemes have been considered techno-economically acceptable by the TAC. 11 major, 2 medium and 8 ERM schemes are under techno-economic appraisal in CWC and other central agencies, while 7 major, 14 medium and 17 ERM schemes have been returned to states or deleted from the list of pending schemes in CWC. A list of ongoing major projects which have not been approved so far, with their status of approval is attached at Annexure-II(7).

The Working Group recommends the states should expedite the investment clearance for the projects found techno-economically acceptable by TAC and also expedite techno-economic clearance and investment clearance for unapproved projects.

2.7 EXTERNALLY AIDED PROJECTS IN VIII PLAN

In view of the commitments made for externally aided projects with external agencies, priority is given to these aided projects in plan resources allocation. These projects also receive closer attention at all levels and the outlays for these projects are earmarked by the Planning Commission.

List of externally aided major & medium projects in operation during VIII Plan is given in Annexure-II(8).

The following table gives year wise total expenditure, expenditure incurred on externally aided components and the re-imbursement during the first three years of VIII Plan.

Year	Total expenditure on major & medium projects (Rs.crores)	Expenditure on World Bank aided components (Rs.crores)	Reimbursement of External Aid (Rs. Crores)
1992-93	3015	722	598
1993-94	3685	803	512
1994-95	3570	737	353
Total	10270	2262	1463

Externally aided major & medium projects accounts for about 18% of the estimated cost in relation to all ongoing projects in the VIII Plan. However, the expenditure incurred on the externally aided components during the first three years of VIII Plan is 31% with respect to the total expenditure incurred on the major & medium irrigation programme of the country. The reimbursement comes to about 65% with respect to the expenditure incurred on externally aided projects and 7% with respect to the total expenditure incurred on major & medium irrigation programme in the country.

A study of externally aided projects indicates that inspite of getting overriding priority in funding, better exposure to modern management techniques & expertise, world Bank aided projects become costlier than domestically funded projects generally due to inclusion of additional elements incorporated in the scope of the aided projects. While some of the infrastructure is being created with external assistance the benefits fail to accrue in the proportion of the investment made because external assistance is generally confined to time slice components of the project and funds for remaining portion of the schemes lacks matching funding by the states. It is also observed that a larger % of available funds is allocated to aided projects, resulting in imbalance of funding to the other ongoing projects, which in turn leads to further time & cost over-runs for these projects. It would thus be desirable that fund

constraints for the overall major & medium irrigation sector needs to be given due weightage while making allocation for externally aided projects. In number of externally aided schemes it is aimed to improve the productivity & sustainability of Water Resources Sector, introduce multi-sectoral water planning, integrated farmer participation, strengthening of Institutions for Water Development Management & Planning. The external aid invariably covers schemes components to complete selected viable ongoing projects for increased availability & reliability of water to improve productivity through rehabilitation /modernization of selected existing schemes.

CHAPTER III

STRATEGY & SIZE OF IX PLAN

3.1 Broad Strategy

Based on experience of performance during 8 th Plan, it will be necessary to have pragmatic approach for 9 th plan in order to come out of the time & cost over run syndrome. The basic strategy for this would be to provide full funds as per the scheduled plan of construction so as to complete maximum number of ongoing projects as well as selected new projects and achieve the target of creation of irrigation potential within scheduled time frame. For estimation of fund requirements during IX Five Year Plan the projects have been classified in the following categories:

1. Externally aided projects with commitment made for implementation in order to fully utilize the credits.
2. Inter-State Projects.
3. Projects taken up prior to 5th Plan.
4. Other ongoing projects where substantial expenditure have been incurred.
5. Medium Schemes that can be completed during 9th Plan.
6. Selected new schemes.

It is proposed to provide adequate funds to implement these projects according to their scheduled programme. For the projects which are identified for completion during the 9th Plan, entire spillover cost alongwith escalation of an overall rate of 10% per annum on balance cost is also proposed to be provided. In order to achieve the ultimate potential in the foreseeable future and to reduce regional imbalances, selected new schemes could also be taken up. To ensure completion of scheme in a planned manner, diversion of funds from one scheme to another should not be permitted. In other words, there will have to be specific earmarking of funds for all the schemes under construction and effective monitoring by High Level Committee comprising of Project, State and Central Officials.

3.2.1 Externally aided Projects

In order to ensure that full reimbursement of the agreed credits for the external aiding agencies is available, commensurate expenditure in projects has to be ensured as per programme outlined in the credit agreements. It is necessary to ensure that only such projects are posed for external assistance where all infrastructural works, layouts and detailed designs of headworks, main canal and major structures are either ready or could be provided within time schedule. Projects should simultaneously be got cleared by the Advisory Committee and approved by the Planning Commission.

Suitable environmental action plan, rehabilitation measures, organisational structure and action on agreed terms should be formulated and implemented as per schedule so as to get timely reimbursements as well as avoid slippages. Some of the ongoing projects spilling over in the IX plan are externally aided. The projects falling under this category are indicated below:

**Externally aided Major & Medium Irrigation Projects
spilling over to IX Plan**

Sl. No.	Name of Project	Agency	Credit No.	Closing date	Spillover cost into IX Plan (Rs. Crores)
1	2	3	4	5	6
HARYANA					
1.	Haryana Water Resources Consolidation Project	World Bank	2592	12/2000	726.39
ORISSA					
2.	Upper Indravati Left Canal 14 to 52 kms.	OECD (Japan)	ID-P-57	1/99	351.31
3.	Upper Kolab	-do-	ID-P-56	7/98	17.00
4.	W.R.C.P.	World Bank		9/2002	1117.27
PUNJAB					
5.	Punjab Irrigation & Drainage Project	World Bank	2076-IN 3144-IN	3/98	6.96
RAJASTHAN					
6.	Sidhmukh Nohar	European Economic Community		12/2000	40.68
TAMILNADU					
7.	W.R.C.P.	World Bank	2745-IN	3/2002	1220.00
KARNATAKA					
8.	Upper Krishana Stage I, Phase-II	World Bank	Cr2010 Ln3050	12/96*	882.53
MAHARASHTRA					
9.	Composite Irrigation Project, St-III	-do-	Cr1621	12/96*	1027.29
Total:					5389.43

*Aid likely to continue in IX plan

3.2.2 Inter-State Projects

This category of projects deserves priority as lack of provision of funds by one of the beneficiary states affects the overall progress of the project, resulting in a national loss. In most of the Projects, there is some form of inter-state machinery already set up to review the progress of the

projects, to fix the construction programme from year to year and also to ensure that adequate funds are provided by the concerned States. However, the experience in the VIII Plan indicates that some of the States have not been fulfilling their obligations in spite of the decisions taken at the inter-state meetings as a result of which slippages occur in the implementation of the schedules. In the IX Plan, therefore, it is necessary to ensure that funds for such projects are earmarked by the Planning Commission and also that the States do not divert such earmarked funds to other projects. A list of major inter-state projects which will be under execution in the IX Plan is given below along with their spillover cost.

Inter-State Projects which will be under execution in IX Plan.

Sl. No.	Project & State	Plan in which started	Plan in which to be completed	Spillover cost (Rs. Crores)
1	2	3	4	5
1.	Tungabhadra High Level Canal Stage-II Andhra Pradesh Karnataka (Completed)	III AP 66-69	IX	272.23
2.	Gurgaon Canal Haryana Rajasthan	III III	IX IX	9.96 10.16
3.	Tajewala Barrage (Hathnikund Barrage) Haryana Uttar Pradesh	VIII VIII	IX IX	726.39 23.90
4.	Ban Sagar Bihar Madhya Pradesh Uttar Pradesh	V V V	IX Beyond IX -do-	70.04 830.83 294.21
5.	Rajghat Madhya Pradesh Uttar Pradesh	V V	IX IX	251.25 38.00
6.	Tillari Goa Maharashtra	V AP 78-80	IX Beyond IX	42.04 215.08
7.	Sardar Sarovar Gujarat Rajasthan	VI VI	Beyond IX Beyond IX	7599.38 440.91
8.	Mahi Bajaj Sagar Gujarat Rajasthan	IV IV	IX IX	0.30 17.01
9.	Bawanthadi Madhya Pradesh Maharashtra	VI VI	IX Beyond IX	7135.12 234.69

10.	Dudhganga Karnataka Maharashtra	V V	IX Beyond IX	92.85 392.30
11.	Telugu Ganga - Andhra Pradesh Tamil Nadu (Water Supply to Madras City)	VI	IX	1190.44
12.	Subernarekha Bihar Orissa West Bengal	V. N.A. N.A.	Beyond IX	718.44
13.	Sutlej Yamuna Link Canal Haryana Punjab	V VI	IX IX	79.72 221.86
14.	Shahnagar Himachal Pradesh Punjab	VII VII	Beyond IX N.A.	139.94 N.A.
Total				14,108.94

3.2.3 Projects taken up prior to V Plan

There are as many as 24 projects which were taken up prior to 1974 i.e. beginning of the V Plan and which are still spilling over into the IX Plan. All these projects excepting two namely Warna in Maharashtra and Mahanadi Reservoir in M.P. are likely to be completed during IX plan. All efforts should be made to complete Warna Project & Mahanadi Reservoir Project in next plan if not in IX plan. The pre-V Plan Projects should, therefore, receive full requirement in allocation of funds. It is seen that some of the projects would have achieved more than 90% of potential by end of VIII Plan. Such projects should be given special attention and the remaining works if any should be completed in the 1st or 2nd year of IX Plan. A list of these 24 projects is given below alongwith their spill over cost in IX Plan :

PRE-FIFTH PLAN PROJECTS SPILLING OVER TO IX PLAN

Sl. No.	Name of Scheme	Plan in which Started	Latest Estimated Cost	Spill Over cost to IX plan	Ultimate cost to IX plan	Potential Created Upto VIII Plan
Andhra Pradesh						
1.	Nagarjuna Sagar	II	950.00	121.48	895	839
	Sriram Sagar St. I	III	1519.15	492.78	411	372
3.	Pulivendula Br. Canal	IV	34.51	7.81	24	23
4.	Vamsadhara St. I	IV	78.60	4.62	20	19
Bihar						
5.	Western Kosi Canal	III	357.44	85.14	235	38
Gujarat						
--	Mahibajaj Sagar	IV	N.A.	0.30	-No direct benefit	
6.	Panam	IV	95.34	3.90	49	49

III(4)

7.	<u>Haryana</u> Gurgaon Canal	III	40.41	9.96	81	61	75
8.	<u>Karnataka</u> Malaprabha	III	528.73	84.89	218	184	84
9.	Upper Krishna St I (Externally Aided)	IV	3427.32	882.53	425	305	72
10.	<u>Kerala</u> Kanhirapuzha	III	59.78	28.78	22	-	-
11.	<u>Madhya Pradesh</u> Mahanadi Res.	IV	1223.45	821.77	305	97	32
12.	Kolar	IV	185.00	17.63	61	25	41
13.	Sindh Phase I	IV	56.43	14.83	45	5	11
14.	Jonk	IV	46.38	14.02	15	8	53
15.	Pairy	IV	33.54	4.69	73	4	5
16.	<u>Maharashtra</u> Krishna (Externaly Aided)	III	716.00	31.94	136	92	68
17.	Bhima (Externaly Aided)	III	627.00	91.28	163	139	85
18.	Kukadi (Externaly Aided)	AP (66-69)	355.00	107.95	113	81	72
19.	Upper Godavari	AP (66-69)	136.00	48.00	67	62	93
20.	Warna	IV	699.00	488.57	114	60	53
21.	Upper Tapi	IV	93.00	3.67	55	52	95
--	<u>Rajasthan</u> Gurgaon Canal	III	35.40	10.16	28	23	82
22.	Mahi Bajaj Sagar	IV	383.63	17.01	-No direct benefit--		
23.	<u>Uttar Pradesh</u> Sarada Sahayak	III	1064.60	124.92	1582	1180	75
24.	<u>West Bengal</u> Kangsabati	II	205.41	20.00	402	388	99

				3538.63			

3.2.4 Other spillover major projects

Out of 119 ongoing major projects of IX plan, if externally aided, inter-state and pre-Vth plan projects are excluded remaining projects are 81 Out of them, 65 projects are in advance stage and could be completed in IX plan These projects are also to be given regular funding to ensure completion. The remaining project being in intital stage should get the funding according to their scheduled plan of implementation.

3.2.5 Medium Schemes

Normally, the medium schemes are expected to be completed in a period of five years. Therefore, generally such schemes should not spill over from one Plan to another. However, as indicated in chapter II para 2.3 as many as 176 medium schemes will spill over into IX Plan. Almost all of these are again capable of completion during IX Plan. Adequate funds for completion of these schemes also therefore, need to be provided during the IX Plan.

3.2.6 New Schemes

Although in order to complete maximum number of on going projects and to derive maximum benefits from investment made during IX Plan, taking up of new projects are to be restricted yet for removing regional imbalances and for development of tribal and drought prone areas taking up new projects could not be ruled out. Moreover, in order to maintain a continuity in the development of irrigation potential during succeeding plans with the national objective of attaining full potential by 3rd decade of 21st century, it would be necessary to have adequate number of projects in full implemetation stage at the beginning of the Xth Plan for which preconstruction activities could be taken up during IX th plan. As stated in chapter II para 2.3. 12 major and 6 ERM ongoing and new projects of VIII plan on which expenditure incurred is less than 5% are taken as new projects of IX plan. The IX plan proposals received from some of the S tates also contain new projects. The total number of new Major , Medium & ERM projects for which outlay have been proposed are 78,139 & 42 respectively. Once these projects are taken up for implementation funds should be provided as per the scheduled plan of construction to avoid time & cost over run. Additional new schemes,if any, proposed to be included by the States could be considered at the time of formulation of IX Plan by the Planning Commission.

3.3 State Plan Proposals

All the states were requested by C W C to send IX Plan proposals. The IX Plan proposals were received in the prescribed format from Assam, Bihar, Andhra Pradesh, Haryana, Karnataka, Madhya Pradesh, H.P., Orissa, Gujarat ,Rajasthan , J&K and Uttar Pradesh. From rest of the states, the proposals were not been received. The outlay in respect of those states from where the proposals have not been received have been worked out based upon the following assumptions:

- i) Actual expenditure for 1995-96 is considered same as the outlay.
- ii) Outlay of the Project for 1996-97 is taken as 10% more than outlay recommended by Working Group of 1995-96 limited to balance of funds required.
- iii) Latest estimated cost as given in States Annual Plan 1995-96 is assumed as the latest and the spillover cost is increased @ 10% p.a. to arrive at spillver cost at the beginning of IX Plan (1997-98).
- iv) Anticipated potential for 1994-95 is considered same as achieved.
- v) Potential created for 1995-96 is considered same as anticipated.
- vi) Potential target for 1996-97 is assumed as equal to target of 1995-96 projectwise.

Apart from the above following have also been considered in respect of the States from where the information has not been received.

- i) Provisions for liability @ 10% of the outlay for 1996-97 for the projects likely to be completed during 8th Plan has been made.
- ii) All the ongoing and new projects of 8th Plan on which the expenditure incurred is less than 5% are treated as new projects of IX Plan and sufficient outlay as deemed necessary is provided for them.
- iii) The projects which are identified for completion during IX Plan are provided with outlay equal to their spillover cost and cost escalation @ 10% per annum added in the proposed outlay.
- iv) Full outlay has been made for medium projects assuming their gestation period as five years.

Detailed proposals are indicated at Annexure III(1). Some of the important aspects of the proposals are discussed below:

3.3.1 Liabilities of completed projects

It has been observed in Chapter II para 2.3 that 38 major 100 medium 45 ERM projects are likely to be completed in the VIII Plan. It is, however, likely that, though the construction works of some of these projects would be completed some financial liabilities like disputed claims, minor works left out, etc. would be carried forward. Though precise amounts required for this purpose would not be available at this stage, tentative amounts @ 10% of the last year outlay for these projects have been provided under this head on a lump sum basis. However, when the IX Plan is finally formulated, the provisions should be made project wise. The total amount proposed at present is Rs205 crores.

3.3.2 On going Projects

As described in para 3.1, the major ongoing projects have been classified into four categories.

- i) Externally aided projects.
- ii) Inter-state projects other than externally aided.
- iii) Pre-V Plan projects other than externally aided or interstate and;
- iv) Other on-going projects.

Projects which can be completed in the IX Plan have been identified under each category (The list of such projects is given at annexure III (2) and for them full provision for the spillover cost including likely enhancement of cost due to escalation (which has been taken @ 10% per annum on discounted balance cost) has been made. For the remaining on-going project which are not likely to be completed, outlays are

provided in such a way that the physical progress as rescheduled could be achieved from them. It is the view of the Working Group that the provisions proposed for the on-going projects should be maintained as the first charge when the IX Plan is finally formulated.

The status of irrigation projects was reviewed during the first and second State Irrigation Ministers' Conference held in 1975 and 1976 and the continuous slippages in the completion targets of the projects was noted. The need to exercise a better control over the implementation of irrigation projects was felt and a three tier monitoring of major and medium irrigation projects at project, state and central level was recommended. At central level this work has been entrusted to Central Water Commission. It is felt that the State and Project level monitoring units are not working effectively. The Working Group recommends that the State and Project level units should be strengthened.

It is, however, mentioned that the proposed outlay for ongoing schemes is based on the latest estimated cost of each project indicated in the summary records of state APs 1995-96 in respect of the states from where the latest information/proposal for 9th Plan have not been received and latest estimated cost as assessed in 1996-97 in respect of states from where the 9th plan proposals have been received. The latest estimated cost should, therefore, be increased @10% per annum to neutralise the inflation effect to arrive at the estimated cost in the beginning of 9th plan i.e 1997-98. The estimated cost of the projects and thereby the outlay should be increased by 20% for all ongoing projects in case of states from where the proposal have not been received & by 10% in case of states from where the proposals have been received. A statement showing statewise outlay for all ongoing projects as proposed & with enhanced estimated cost as discussed above is given at table-2. Accordingly, the outlay required for ongoing project works out to Rs40623 Crores.

3.3.3 New Projects

As already indicated, new projects proposed for taking up in the IX Plan are 78 major, 139 medium & 42 ERM. These include 12 major & 6 ERM projects which were started in previous plans but the expenditure incurred on these so far is less than 5% of their latest estimated cost. These projects are not being considered as ongoing projects in IX Plan.

Among the new projects proposed to be taken up 5 major, 72 medium & 2 ERM projects are likely to be completed during the IX Plan itself and hence they have been provided with full outlays. In all, Rs.13750 crores has been provided for the new projects.

It is also recommended by the Working Group that Multipurpose projects having hydel component should be accorded priority over thermal projects by the States in execution of new projects.

3.3.4 Special repairs of Existing Irrigation System

On account of inadequate maintenance grants, the existing system are not being maintained properly as a result of which some of the important structures could not be repaired and even some of the essential items of maintenance are not carried out. As a result, the areas intended to be irrigated by a particular system are not fully / adequately irrigated on account of progressive deterioration in the system for lack of timely repairs and maintenance. This creates a very peculiar and serious situation, namely, that on one hand a large Plan outlay is spent on creation of new irrigation potential on the other hand potential already created cannot be fully utilized on account of inadequate maintenance. This ultimately defeats the very purpose of creating irrigation systems with such a large capital expenditure. It is proposed that while operation and routine maintenance will continue to be funded from non-plan, works such as special repairs, replacement of small structure etc. should be provided for under Plan. A Head of "Special Repairs of Existing irrigation System" has, therefore, been provided for in the IX Plan. It is recommended that the funds should be provided @ Rs. 300/ha. of net irrigated area in the States during the Plan period under this head. For convenience's sake the potential created upto the end of APs 1990-92 has been adopted as the base for working out the funds requirements. The total amount recommended under this head is Rs.880 crores.

3.3.5 Dam Safety Measures

Any public civil works facility such as dams, buildings or bridges present a degree of risk to loss of life or damage to property in the event of their failures. All such structures also have the characteristics to change over time in their adjustment to their surrounding and in their capability to resist the forces imposed upon them by man & nature. Dams, however, due to the ever changing condition of the population located along the river banks downstream often constitute a higher hazard in case of failure than other structure

The safety of storage dams and water related structure therefore assumes importance. In order to have an effective Dam Safety Assurance Programme in the states G.O.I had launched "Dam Safety Assurance & Rehabilitation Project" in 8th plan with World Bank Assistance. The main objective of the project is to improve the safety of selected dams in the country through remedial works, installation of basic safety facilities like monitoring instrumentation, communication etc. and strengthening of institutions. During VIII Plan provision of Rs. 423 Crores was made for this project. As per latest review the project will spill over into 9th Plan. As the remedial measure once taken up on the distressed dams, cannot be discontinued provision has to be made for meeting the expenditure in the ninth plan irrespective of assistance from the World Bank.

The spillover cost of the project during IX Plan will be Rs. 694 Crores out of which the share of Central Institutions will be Rs 29 Crores and balance of Rs 665 Crores will be for the States. The provision for outlay in IX Plan for all the participating states (12nos) have been made under the head "Dam Safety Measures" in proportion to the number of large dams in each state.

3.3.6 Improved Water Management:

The purpose of improved water management is to increase agriculture productivity in existing irrigation schemes by providing low cost infrastructural improvements. Adequate and timely maintenance of an irrigation system is imperative for proper irrigation management. Efficient water management cannot be achieved unless the infrastructure for water conveyance and delivery system is in a reasonably good condition to retain its operational efficiency. IWM provides for minimum essential works for implementation of operational plan for old schemes which are suffering from operational deficiency. These include repairs and renovations to existing structures, provision of new control structures, field channels and drains, measuring devices, upgrading of O&M facilities and equipment including institutional capabilities and orientation training for field staff and farmers. It is considered that an expenditure of about Rs.2000 per ha. of cumulative potential created in each state at the end of IV Plan will be worthwhile in bringing about desired improvements. A tentative amount of Rs. 1939 crores is being provided for this purpose. However, this is only tentative and the States will have to frame specific proposals. If necessary, outlay on this account could be increased.

3.3.7 Survey & Investigation

At present, two items viz. survey & investigation and research and development, are provided for under "Water Development". Funds required to be allotted for surveys & investigations in the Plan as a whole has been worked out on the basis of about one percent of the outlay proposed for projects. The balance irrigation potential to be created at the end of VIII Plan would be of the order of 24.65 mha. in the whole country. Distribution of the total outlay among the various States has been done proportionate to the balance potential remaining to be created in each State.

3.3.8 Research & Development

Water Resources Sector is a key socio-economic sector involving huge investments. Systematic Research & Development (R&D) programmes are to be evolved and continuously pursued in order to provide major S & T inputs in various facets of Water Resources Development in consonance with the targets and directives of National Water Policy. Such targets can only be achieved with twin efforts of new breakthrough in R&D and proper dissemination of the research outputs. Various R & D activities which can be undertaken during IX Plan are discussed in chapter on "Science & Technology". Some of thrust areas of significance for Water Resources Sector Development are "Water Logging & Salinity", "Cost effective lining of Canals", "Efficient Water Management Techniques including better farms application methods", "Dynamic regulation of Canal", "New construction material & Techniques", "Containment of adverse environment impacts of dams & reservoirs" & "Instrumentation of River Valley Projects" etc. Part of the research work will be carried out in Central Institutions & part in the State Sector. Provision of R & D has been made in the state Plan at the rate of 1% of the proposed outlay for on-going projects. The total outlay proposed is Rs.346 Crores.

3.3.9 Training

No specific outlay has been provided for training in few State Plans received in CWC. The disciplines under the subject of irrigation have expanded considerably and the necessity of imparting specialized training to the engineers and staff for obtaining the optimum benefit is now felt increasingly. This matter has been discussed separately in Chapter 11. of this report. The working group has recommended an outlay of Rs.201 crores in the Plan for training and the distribution among the States has been done proportionate to the total outlay of each State for major and medium irrigation.

3.3.10 National Hydrology Project

National Hydrology Project has been taken up with World Bank Assistance by G.O.I. to improve the institutional and organisational arrangement, technical capabilities and physical facilities available for measurement, validation, collection, analysis, transfer and dissemination of hydrological, hydrometeorological and water quality data, and for basic water resources evaluations at central and state level in the country. The project on completion would provide comprehensive, easily accessed and user friendly data base covering all aspects of the hydrological cycle including surface water and ground water in terms of quantity and quality and climatic measurements, particularly of rainfall. The project has taken off in Dec,1995 and spans over a period of 6 years ending in the year 2000-2001.

The total costs of the project is Rs. 609 Crores (163.5 million US \$) out of which Rs. 223 Crores is proposed for central Sector & Rs. 386 Crores for State Sector. The anticipated expenditure on the project during VIII Plan is likely to be Rs. 261 Crores. Thus spillover cost of the project into IX Plan will be of the order of Rs. 348 Crores. The project proposals provides for Rs. 129 Crores under Central Plan and Rs. 219 Crores under State Plan during IX Plan. The distribution among eight participating states of Andhra Pradesh, Gujrat, Maharashtra, Madhya Pradesh, Orissa, Tamil Nadu, Kerala and Karnataka is based upon the discussions of States with Central Govt and the World Bank.

3.3.11 The abstract of Ninth Plan proposals covering financial and physical status covering all the items mentioned in the preceding paras is given in the table-1.

3.3.12 Outlay at Constant Price

The statements at Annexure III(1) indicate separately the outlays proposed including escalation and outlay required at constant prices against each item. From the statewide abstract given in table-1, it would be observed that the total states Plan at constant prices would be Rs.41645 Cr, against the outlay of Rs.54183 crores proposed. It can also be seen from table-2 that an additional outlay of Rs.5130 Crores. would be needed if Latest Estimated Cost of ongoing projects are to increased to take care of cost escalation.

3.3.13 Physical Targets

Physical targets likely to be achieved in the IX Plan is 9.5 mha. Slippage in the target of creation of irrigation potential has been a regular feature in the major and medium irrigation programme. While the target of APs 1978-80 slipped from 2.5 mha. to 1.9 mha, that of VI plan from 5.7 mha. to 3.4 mha, and of VII Plan from 4.3 mha. to 2.225 mha, the slippage of VIII Plan is likely to be from 5.08 mha. to 3.1 mha. A major reason for slippage is funds constraint and delay in implementation of macro to micro disnets works of many projects.

In order to make the targets more rational, the incidence of escalation in the outlays proposed for projects earmarked for completion has been incorporated. Out of 119 major projects spilling over to IX Plan, as many as 99 are capable of and accordingly proposed for completion. Again out of 78 new major projects proposed to be taken up in the IX Plan, 5 are likely to be completed in the Plan itself. List of major projects proposed for completion in IX Plan is given at Annexure III(3). Similarly 248 medium projects are also scheduled for completion. If these schedules are maintained, it should not be difficult in achieving the projected target of 9.5 mha.

3.3.14 Size of Stats Plan

The state Plan proposals discussed above and indicated in detail and in abstract form at Annexure III(1) & table-1 can be summarised as under:

a) Projects included in IX Plan:

	Major	Medium	ERM
i) Spillover from previous plans	119	176	67
ii) New in IX Plan	78	139	42
Total	197	315	109

b) Projects to be completed in IX Plan (Nos.)

	To be completed			Likely spillover to X Plan		
	Major	Medium	ERM	Major	Medium	ERM
i) Spillover Projects	99	176	67	20	-	-
ii) New Projects	5	72	2	73	67	40
Total	104	248	69	93	67	40

c) Outlays (Rs. Crores) As proposed

i) Liabilities of completed projects	205
ii) Ongoing projects	40623
iii) New Projects	13750
iv) Special repairs of existing irrigation systems	880
v) Dam Safety Measures	665
vi) Improved Water Management	1939
vii) Water Development	
a) Survey & Investigation	485
b) Research & Dev.	346
c) Training	201
d) National Hydrology Project	219
Total	59313
Less: Projects under Central Assistance	(-) 5000
	54313
viii) Benefits (Mha) Irrigation potential to be created	9.50

3.3.15

Central Sector Plan Proposals

3.3.15.1 Existing Institutions under Ministry of Water Resources.

There are at present five departments/organisations functioning under the Ministry of Water Resources. These organisations have been playing a very significant role in the field of Water Resources Development and particularly irrigation. With rapid advancement in Science & Technology these organisations are to play active role in this key sector particularly because it has not been possible for the States on account of constraint of resources and other factors to bring about desired improvement in the sector. It is, therefore, felt that the total outlay of Rs.95 crores provided in VIII Plan for these organisations was totally inadequate and should be substantially enhanced in the IX Plan.

The tentative outlays proposed for these organisations are as under :

I) Central Water Commission	163.0 Crores
ii) National Water Development Agency	47.0 Crores
iii) National Institute of Hydrology	36.0 Crores
iv) Central soil & Material Research Station *	25.0 Crores
v) Central Water & Power Research Station *	100.0 Crores

Total	371.0 Crores

Assumed Outlay. Detailed proposals from these organisations not received.

The outlay proposed for CWC includes provision for Hydrographic Survey of Important Reservoirs; Performance Evaluation of completed projects and Environment Impact Assessment Studies; Identification of waterlogged & salinity affected areas in existing irrigation command using Remote Sensing Technique; Monitoring of projects; Training; Computerisation in CWC; and Modernisation & upgradation of library & information bureau; spillover cost of plan schemes in 8th Plan; and creation/strengthening of Design Units / Directorates.

3.3.15.2 Research & Development

Various R&D activities which can be undertaken during IX Plan are discussed in chapter on "Science & Technology". As discussed in para 3.3.8, part of the research work will be carried out in Central Institute & part in the State Institutes. The outlay proposed under this head for Central Sector is Rs.50 crores as detailed in the above chapter.

3.3.15.3 Dam Safety Measures_

This has already been discussed in para 3.3.5. An outlay of Rs.29 crores is proposed to be provided under Central Plan for Dam Safety Assurance & Rehabilitation project as per details in the above stated para.

3.3.15.4 National Hydrology Project

As discussed in para 3.3.10 the spillovers cost of the above project into IX Plan will be of the order of Rs. 348 crores. The share of the project under Central Sector will be Rs.129 crores during IX Plan.

3.3.15.5 National Irrigation Management Institute

Committee of Secretaries constituted by G.O.I recommended setting up of NIMI for greater professionalisation of Water Resources Management in March 1983. The National Water Policy adopted in 1987 has given emphasis on improving the irrigation intensity, close integration of water use and land use policies, equity & social justice in water allocation and research and training to improve the performance of irrigation schemes with a view to maximize production. The VIII Five Year Plan has laid stress on Science & Technology inputs for efficient utilisation of water resources. The 11th National Conference of Water Resources & Irrigation Ministers of the States & Union Territories held on 22.8.95, has endorsed the proposal for setting up NIMI with immediate effect. Accordingly a proposal costing Rs.21 crores has already been submitted to MOWR during 1995-96 for clearance. Work is proposed to be taken up after EFC clearance is given. The productivity of irrigated agriculture is much below the achievable potential. Improved performance of Irrigation systems and their management is essential for growth of agricultural productivity to meet the increasing food & fodder requirements. The broad objective of the NIMI is "Efficient utilisation of Irrigation Potential for higher agricultural productivity by developing & promoting integrated management of land and water resources, identifying and co-ordinating priority areas for research and coherent policy reforms to improve the performance of Irrigation systems"

The role of NIMI will be : (a) Policy Analysis for bringing reforms to improve the Irrigation Management and Water use efficiency. (b) Action Research of multidisciplinary nature to find out viable, practical and widely acceptable solutions influencing performance of irrigation system. (c) Training & Technology Transfer to develop managerial capabilities & skills. (d) Information dissemination & extension of the new technologies & research findings to irrigation managers and the farmers.

3.3.15.6 Reassessment of Basinwise Irrigation Potential

The Ultimate Irrigation Potential (UIP) of the country was assessed in 1960s as 113.5 million hectares (M.ha.). The potential of 113.5 M.ha comprises of 58.5 M.ha. through major & medium schemes, 15 M.ha. through minor surface water schemes and 40 M. ha by ground water schemes. The potential created so far is about 88 M. ha of which 32.5 M. ha is from major and medium projects and 55.5 M. ha from minor surface and ground schemes. Cumulative potential likely to be created by 8th Plan will be of the order of 90.9 M. ha.

The population of India will continue to grow and is expected to stabilise only around year 2050 when the population is expected to be about 1500-1800 million. India would then require about 450 million tonne food grains at the present level of consumption. It will be necessary to extend irrigation facilities to the full 113.5 M. ha and beyond. It has been assessed that irrigations potential should be of the order of 130 M. ha for food crops alone and 160 M. ha for all crops in order to meet the demands of the country by 2050. Thus, there is a need not only to develop the irrigation potential yet to be exploited in the country but also to review the irrigation potential under each of the existing and ongoing irrigation projects.

The proposal envisages the reassessment of potential of the major and medium irrigation projects basin-wise. The work will be carried out by special cells created in the Water Resources/Irrigation Departments of the State Governments and the expenditure thereon will be fully reimbursed by the Centre. This will be a Centrally sponsored Scheme. The proposal also covers setting up of a Co-ordinating and Monitoring Cell in CWC for overseeing and compiling the reports of the States. The Cell in CWC is proposed to be created by redeploying the existing staff. The total outlay of the scheme is estimated to be Rs. 23.2 crores over a period of four years proposed to be taken up during the 9th Five Year Plan period.

3.3.15.7 Central Assistance to WALMIS

Improved performance of irrigation systems and their management is essential for growth of agricultural

productivity and for increasing food and fodder requirements. The National Water Policy adopted in 1987 has given emphasis on improving the irrigation intensity, close integration of water use and land use policy, equity and social justice in water allocation and research and training to improve the performance of irrigation schemes.

Knowledge is required on new developments of possible alternatives to improve the performance of an irrigation system. A deep insight through detailed analysis of area specific problems and policies, multi-disciplinary orientation of the Irrigation Departments through specialized training programmes, accountability and farmers participation with attention to maintenance and improving water management are necessary to enhance the overall performance. The lessons learnt on performance of Govt. owned and managed irrigation systems below expectation necessitated introduction of management reforms and creation of 11 WALMIs under USAID programme was a step forward in this direction. The WALMIs, State Irrigation Departments and Central organisations connected with irrigation management are to be involved in a closely knit national strategy to bring about qualitative change in improving the irrigation performance. Training of irrigation and agricultural staff at all levels has been considered as an important activity. The Water Resources Management & Training Project (WRM&TP) under USAID Programme assisted in setting up of 11 WALMIs at Hyderabad in Andhra Pradesh, Patna in Bihar, Anand in Gujarat, Dharwad in Karnataka, Khozikode in Kerala, Bhubaneshwar in Orissa, Trichy in Tamil Nadu, Kota in Rajasthan, Lucknow in U.P., Bhopal in Madhya Pradesh and Arungabad in Maharashtra. The programme ended in September 1992 with a total expenditure of US \$ 50 million. A status report on WALMIs was prepared during July 1992 covering each of the 11 WALMIs. The report has brought out the strengths and weaknesses of these institutes after the close of the project. The Central Water Commission could not have direct interaction with the WALMIs nor could provide any financial assistance for undertaking various activities like policy analysis, training and technology transfer, action and adaptive research and extension services. Due to financial constraints, most of the WALMIs are now not in a position to undertake the programme assigned to them in accordance with the identified objectives. Later, North-eastern Regional Institute for Water & Land Management was set up at Tezpur in Assam under the aegis of North-Eastern Council. This Institute did not receive any direct support from Govt. of India or any other bilateral assistance.

Haryana Government is also in the process of re-structuring its irrigation and research institute at Kurukshetra into an Irrigation Management Institute and the proposal has been accepted by the Govt of Haryana in principle.

Recently, Government of Himachal Pradesh has requested the Planning Commission to set up a WALMI to meet the specific irrigation research and management needs of the hilly State in particular and the North-West Himalayan region in general. The other mountainous areas can also take benefit of the proposed WALMI as the problems of hills are different to those of plain areas. The hill climatic and topographical conditions require different management interventions. The Government of Himachal Pradesh have recently constituted a Working Group under the Chairmanship of Chief Secretary for effective planning, implementation, operation and maintenance of irrigation schemes. The Group has recommended setting up a separate WALMI to cater to the needs of hilly areas. The Chief Minister, Govt. of Himachal Pradesh also urged the National Water Resources Council in its last meeting chaired by Prime Minister on 6.2.96 to provide Central assistance for a new Research Institute in the State.

It is proposed to provide 50% matching grants to all the WALMIs for taking up the assigned programmes. The new WALMI will require additional expenditure on creating the basic infrastructure and similar matching grant can be provided to them. The remaining 50% expenses will be borne by the respective State Governments.

On an average, the annual expenditure for 12 WALMIs works out to Rs.24 crores. The proposal for new WALMIs is estimated to cost Rs.22 crores with a project period of 5 years. The total central assistance in IX Plan on 50% matching grant basis works out to Rs.60 crores for the old WALMIs and Rs.11 crores for new ones. Thus a proposal for central assistance of Rs.71.00 crores has been made for IX plan.

3.3.15.8 Central Assistance for Inter-State & Important Projects.

As discussed in chapter IV on TOR (iv) related to funding & implementation of inter-state project, an outlay of Rs.5,000 crores is proposed to be provided during IX Plan for rendering special assistance to identified inter-state & important projects as per the list enclosed with the chapter.

3.3.15.9 Central Outlay for Capital Works

The Central Water Commission field offices are scattered all over the country and mostly accommodate in rented buildings. This involves huge recurring expenses & frequent vacation notices from the building owner which is not conducive to smooth functioning of the field unit. The MOWR have evolved provision for construction of departmental buildings and capital works are proposed to

be undertaken accordingly. A provision of Rs.51 crores is proposed to be made during IX Plan for this activity.

3.3.15.10 Other Miscellaneous Schemes

There are a few small schemes related to specific areas of works proposed to be taken up during IX Plan. These are covered under respective departmental proposal.

3.3.15.11 Size of Central Plan

The proposals made under Central Plan in the foregoing paragraph sum up as under :

	Rs. Crores
i) Existing Organisations under Ministry of Water Resources	371.00
ii) Research & Development	50.00
iii) Dam Safety Assurance & Rehabilitation Project	29.00
iv) National Hydrology Project	129.00
v) National Irrigation Management Institute	21.00
vi) Reassessment of Irrigation Potential	23.00
vii) Central Assistance for WALMIS	71.00
viii) Central Assistance for Inter-State Project	5,000.00
ix) Outlay for capital works	51.00

Total	5,745.00

3.3.15.12 The total IX Plan outlay proposed by the Working Group is thus as under :

State Plan	54313 crores
Central Plan	5745 crores

	60058 crores

The Central Plan constitutes about 9% of the total plan outlay proposed for major & medium Irrigation programme.

3.4 Techno-Economic Clearance of Projects

According to the procedure laid down by the Planning Commission, major and medium Irrigation and Multi-purpose projects are to be techno-economically approved in the Central Water Commission, cleared for environment and forest angle by the Ministry of Environment and Forests, and considered by the Advisory Committee for recommendation to Planning Commission regarding its viability and inclusion in the State Plans. Based on the recommendations of the Advisory Committee, the Planning Commission is to accord investment clearance for the Projects so that the States could take up the construction of such approved projects. It is, however, seen that state Govts submit proposal for funding of unapproved schemes. It is desirable that working group should not recommend such schemes for funding. It is also noticed that estimates of projects cleared by Advisory Committee & approved by the Planning Commission are not revised as per norms & submitted for clearance and requisite approval.

In order to ensure that funds are spent in technoeconomically sound projects, it is absolutely necessary that no outlays are proposed by state Governments for unapproved schemes. There have also been many instances where after the approval of the Planning Commission, revised estimates are not sent to the Centre for examination in which the costs have increased manifold. In many cases, the original scope of project is changed. In order to have a financial discipline, it is also necessary that funding for such projects is discouraged.

3.5 Drought Prone Areas

It has already been stated under para of previous chapter that the drought prone districts cover about 42 % of the culturable area of the country. The irrigation potential which was targetted to be created by projects benefitting drought prone districts also constituted about 41% of the total plan targets in the VIII Plan. However, the likely achievement will be only 32% of the target. There are 48 major projects benefitting drought prone districts. The list of these projects is given at Annexure III(3). The Irrigation potential proposed to be created by these projects in IX Plan is 2.40 mha. out of the total plan target of 9.34 mha. The total plan outlay proposed for these projects is Rs.14.861 crores. The following is the position in respect of States having more than 40% of their culturable area as drought prone.

States	%of culturable area as drought prone	IX Plan target of potential (mha.)	
		For whole State	For Projects in drought prone area
Karnataka	87	0.742	0.646
Gujarat	79	0.771	0.609
Rajasthan	66	0.475	0.314
Tamil Nadu	65	0.027	0.018
Andhra Pradesh	48	0.803	0.385
Maharashtra	47	0.909	0.427

3.6 Tribal Areas

The list of projects benefitting tribal areas in IX Plan are given in Annexure III(4). There are 19 major projects in this category. The irrigation potential proposed to be created by these projects in the IX Plan is 1.30 mha. The total outlay proposed for these projects is Rs.3203 crores.

CHAPTER IV

REVIEW OF THE EXISTING MECHANISM OF CONTROL BOARDS WITH REGARDS TO FUNDING & IMPLEMENTATION OF INTERSTATE PROJECTS AND SUGGEST APPROPRIATE MEASURES FOR RESOLVING SUCH PROBLEMS INCLUDING PROVISION OF INADEQUATE OUTLAY

At present Central Water Commission is looking after the work related to Inter-state Rajghat Dam and H.E. Project being executed under the direction and control of Betwa Control Board and Bansagar Dam Project being executed by Water Resources Department of Govt. of M.P. under overall direction and control of Bansagar Control Board.

A brief of the present status of the two projects is given below.

4.1 Rajghat Dam

The Chief Ministers of Uttar Pradesh and Madhya Pradesh signed an agreement on 22 July, 1972 regarding use of Betwa river waters by the two states by constructing Rajghat Dam. The foundation stone of the project was laid by Hon'ble. Prime Minister of India on 14.4.73. The Betwa River Board was constituted under Betwa River Board Act 1976 promulgated by the parliament. Union Minister of Water Resources is the Chairman of the Board.

Construction of the project was started in the year 1978 with a programme for completion by June, 1986. The project was cleared by the Planning Commission in July, 1980 for an estimated cost of Rs. 123.22 crores.

As per the interstate agreement the cost of the dam and appurtenant works is to be shared equally by M.P. and U.P. The two states were required to make provision of Rs. 50 cr. each for this project in the seventh plan period. However only 41.63 cr. and Rs.26.57 cr. were made available by the UP and MP Govts respectively during this period leaving shortfall of Rs. 31.08 cr. The contribution during the last four years was as under:

Fig. Rs. Cr.						
Years	Contribution decided by the Board		Receipt from the states		Shortfalls	
.....	MP	UP	MP	UP	MP	UP.
1992-93	10.00	5.00	7.00	5.00	3.00	-
1993-94	15.00	4.00	7.40	4.00	7.60	-
1994-95	19.00	6.00	1.25	4.00	17.75	2.00
1995-96	23.00	2.00	1.00	0.50		
(till 7/95)						

Due to inadequate funding by the two states the completion schedule of the project had to be revised from time to time and the completion schedule was last revised to December, 1996. The estimated cost was revised to 213.66 crores at 1987 price level and again to 266.16 crores at March 1995 price level (Under examination).

Almost 95% civil works have been completed but due to inadequate funding the project is still likely to take 2-3 years for completion.

As a result not only the cost of construction has increased from 123.22 crores to 266.16 crores but the corresponding benefits have also been delayed. Many a times authorities are not even able to pay the salary of the officers and staff due to non-availability of contribution from the states.

4.2 Rajghat Hydroelectric Project:

The project envisages the construction of dam to power house with installed capacity 3x15 MW. The project estimate was initially approved by Planning Commission for an estimated cost Rs.37.47 crores which has since been revised to Rs.118.36 crores at March, 1994 price level. The project was required to be funded equally by UPSEB and MPEB in ten years after completion of the project.

The civil works of the project are being executed by the Betwa River Board and E&M. works are being executed by M.P.E.B.

Upto June, 1995 expenditure of Rs.52.95 crores has been incurred on the project. The first unit is scheduled to be commissioned by July, 1987 according to the latest revised schedule.

4.3 Bansagar dam Project:

An interstate agreement on allocation of waters of Sone river, construction of Bansagar project and sharing of costs and benefits of the project was signed by Chief Ministers/governor of Bihar, MP and UP on 16.9.73. As per this agreement the cost of Bansagar project including cost of rehabilitation will be shared by MP, UP and Bihar in the ratio of 2:1:1. Union Ministry of Agriculture and Irrigation constituted Bansagar Control Board vide Resolution dated 30th Jan, 1976 under Chairmanship of Union Minister of Water Resources. The project is being executed by Water Resources deptt. of Govt. of MP under overall directions and control of the Bansagar Control Board and the Executive Committee.

The project was approved by the Planning Commission for an estimated cost of Rs. 91.30 crores at 1977 price level and the latest estimated cost is Rs. 936 crores at 1991 price level which includes Rs. 300 cr. for construction of dam and appurtenant works and Rs. 636 cr. for land acquisition and rehabilitation.

The construction of the project was started in 1978 with initial schedule of completion by 1987. As per latest approved schedule the project is to be completed by June, 2001.

The civil works of the projects are in advanced stages of completion. However the project is lagging behind on account of delay inland acquisition and rehabilitation. The project has a massive programme of acquisition of 34765 ha. of private land in 336 villages and rehabilitation of about 50000 families.

At present work of Masonry dam is held up since 1992 due to delay in rehabilitation above EL 322. The rehabilitation programme of the project is begin carried out as per norms approved by the Executive Committee. However the R&R policy proposed by the Govt. of MP for the project has been under consideration of the Control Board/Executive Committee and many items of the policy having substantial bearing on the cost of the project, have not been agreed by UP and Bihar.

	Rs. in crores				
	91-92	92-93	93-94	94-95	95-96
Requirement of funds for the project	81	107	130	79	90
Budget approved by Board/Ex. Committee	32	42.50	76	79	120
Actual expenditure incurred	40.46	29.46	31.28	40.95	22.84 (9/95)
Contribution by partner states towards actual expenditure					
U.P.	0.75	2.00	5.5	1.0	5.25
Bihar	Nil	Nil	Nil	Nil	Nil

Upto September, 1995 the total expenditure incurred on the project is Rs. 386.47 cr. and share due from UP is Rs. 31.57 cr. and share due from Bihar from 41.93 cr. Bihar has not contributed any amount during last five years and the contribution by UP is also insignificant.

4.4 Problems in funding

As is clear from the notes given above both dam projects have been delayed mainly on account of non-contribution of the required funds by the partner states. The states are not contributing the required funds inspite of decision of Control Board/Ex. Committee followed up by the repeated references as well from the Hon'ble Union Minister of Water Resources and Chairman of the two Boards to the Chief Ministers/Governors of the states.

4.5 Other interstate Projects

Apart from Rajghat and Bansagar projects the ongoing projects include 12 other major projects which are inter state projects and have been taken up by two or more states as per agreements reached between them. Some of these projects are Gandak Projects benefitting Bihar, UP., Subernarekha projects benefitting Bihar, Orissa, and West Bengal, Daman Ganga Project benefitting Gujrat, Dadar and Nagar Haveli and Daman & Diu; Dudh Ganga Project benefitting Karnataka and Maharashtra; Sardar Sarovar and Narmada Sagar projects benefitting Gujarat; Maharashtra, Rajasthan and MP. These projects are to be funded by the participating states but they are unable to provide required funds out of their state plan resources.

In case of interstate projects all the partner states are not equally eager for completion of the projects. Therefore even if one of partner states wants to provide it's share and complete the project it cannot do so in the absence release of corresponding shares of funds from other partner states. For example in case of Bansagar dam project eventhough MP intends to contribute it's share of funds and complete the project, it cannot do so in absence of funds to be provided by UP and Bihar. State of UP is not contributing funds for the projects since work on their canal project is yet to be started and they are not likely derive any benefit with the early completion of the project.

4.6 Special Central Assistance

Apart from the problems of differing and unequal interest of the participating states in the interstate projects, the general resources crunch with the state irrigation deptts is one of the major reasons due to which they are unable to contribute required funds. Besides the interstate projects, there are some important projects which also suffer the general resource crunch. Presently almost all the projects in this sector are planned, implemented and funded by the state govts. Out of their own resources. The central assistance is provided in the form of Block Loans/ Grants as per procedure laid down by the NDC. For timely completion of interstate and other important projects to provide special central assistance in the form of matching grant for identified projects.

Criteria for selection of projects for central assistance shall be as under.

1. Interstate projects where agreements on sharing of cost and benefit exists.
2. Important projects preferably storage dams involving drinking water components for mega cities.
3. The projects should be cleared from techno-economic & other angles.

Interstate projects could be executed by agencies viz. Control Boards and similarly important projects could be handled by Projects Boards

A list of projects identified for central assistance is enclosed giving details of proposed outlays for IXth plan under Central Assistance Programme. It is proposed to provide an outlay of about Rs.5000 cr. in IXth five year plan for special assistance to these projects in the form of matching grant against a total outlay of about Rs.10,000 crores.

The Working Group recommends that an inter ministerial committee under the chairmanship of Secretary MOWR Govt of India will decide about modalities of funding of central assistance to the different states as well as review the projects priority.

**LIST OF ONGOING AND NEW INTERSTATE PROJECTS IN IX PLAN FOR
CENTRAL ASSISTANCE**

Sl. No.	Name of Project		Proposed IXth Plan Outlay (Rs.cr.)	Likely component of central assistance (@50% on matching basis)
1.	2		3	4
				(Rs. Crores)
A.	INTERSTATE PROJECTS:			
1.	Bansagar (UP, MP, Bh)	UP. 171 MP. 484 Bh. 82 ----- 737	737	370
2.	Rajghat (MP, UP)	MP 290 UP 61 ----- 351	351	175
3.	Sardar Sarovar (Guj & Raj-Narmada)	Guj 4240 Raj 506 ----- 4746	4746	2000
4.	Subernarekha	Bih 530 Orissa 850 WB 60 ----- 1440	1440	720
5.	Narmada Sagar	MP 200 Guj 35 ----- 235	235	120
6.	Dhudganga	Kar 107 Mah. 92 ----- 199	199	100
7.	Bhawanthadi	MP 155 Mah 35 ----- 190	190	100

1.	2	3	4
			(Rs. Crores)
8.	Shahnahar	HP Pb.	55 88 ----- 143
			143
			70
9.	Tillari	Goa Mah.	52 56 ----- 108
			108
			55
10.	Hathnikund Barrage (Hy. and UP)		30
			15
B. IMPORTANT PROJECTS INVOLVING DRINKING WATER SUPPLY COMPONENT			
11.	Telguganga	AP TN	1310 228 ----- 1538
			1538
			770
12.	Kishau Dam (UP & Delhi)		500
			250
13.	Lakhwar Vyasi (UP & Delhi)		233
			115
14.	Tehri (UP & Delhi)		440
			220
	Total		----- 5080 -----

Say Rs. 5000 crores

CHAPTER-V

BASIN WISE WATER RESOURCES DEVELOPMENT PLAN

5.1 Integrated Development of Water Resources

In a vast country like India with diverse topography, climate, geology and consequently hydrology, the distribution of available water resources is not uniform in various parts of the country. In the initial stages of water resources development, projects were formulated to serve largely irrigation requirements or irrigation combined with hydel power generation. As the projects were few, inter project considerations were absent and each project was generally got investigated and planned as an independent item. Consequently excepting in some basins like Damodar, no plans were formulated for long range development, particularly for integrated use of water resources. Planning was project specific and often for specific purposes only. However, with the increase in the population and the tempo of development, there has been considerable increase in pressure for water for various basic and developmental purposes like drinking and municipal water supply, irrigation, thermal and hydropower generation, industrial requirement, navigation, pisciculture, water quality and maintenance of ecology, etc.

A comprehensive strategic planning for integrated use of our water resources has, therefore, become an urgent necessity and will need to receive new thrust in the 9th Five Year Plan. For achieving the integrated development of river basins, it is essential to have proper co-ordination between the various water resources planning and management agencies operating at the State level and it calls for the establishment of suitable mechanism for co-ordinating the development of river basins in the States. The need for such planning has been highlighted in the past by Irrigation Commission, Irrigation Ministers' Conference, etc. and is also a principle enunciated in the National Water Policy. Their recommendations in brief are given below:

5.2 Irrigation Commission

The Irrigation Commission, 1972 recommended preparation of basin plans in case of small rivers and sub-basin plans in case of large rivers and suggested the following policy for the formulation of river basin plans:

- (a) The basin plan should present a comprehensive outline of the development possibilities of land and water resources to meet the anticipated regional and local needs.
- (b) The plan should:
 - i) indicate a broad frame-work of various works to be taken up in the basins, the reasons why they are preferred to alternatives and the inter-relationship between them;
 - ii) establish priorities in respect of water use for various purposes;
 - iii) indicate inter-se priority of projects;
 - iv) indicate the need for earmarking water for any specific future purposes.
- (c) The plan should be periodically reviewed and revised in the light of changing needs and supplies.

The Commission recommended setting up of a National Water Resources Council and River Basin Commission to further the end.

5.3 National Conference of Irrigation and Water Resources Ministers.

The National Conference of Irrigation and Water Resources Ministers of States and Union Territories held in 1986 in New Delhi discussed the subject in a broader basis. They stressed on a comprehensive and integrated plan of water resources development taking into account not only the needs of irrigation, but also harnessing various other water uses so that the available water resources are put to optimum use. They recommended setting up special multi-disciplinary units in each state to prepare such plans for their portion of the area falling within a basin/ sub-basins. After such plans are prepared, these could be integrated/ synthesised into basin plans using the modern techniques to ensure that the development of the water resources of the basin as a whole is optimal and the areas of conflict between various uses/States are reduced to the minimum and satisfactorily resolved. The Conference wanted the hydrological data collected by various agencies to be freely exchanged between the various basin States for the expeditious preparation of the plans.

5.4 National Water Policy Directives

The National Water Policy adopted by the National Water Resources Council in 1987 summarises the idea of river basin planning and management in the following recommendations:

"Resource planning in the case of water has to be done for a hydrological unit such as a drainage basin as a whole, or for a sub-basin. All individual developmental projects and proposals should be formulated by the States and considered within the framework of such an overall plan for a basin or sub-basin, so that the best possible combination of options can be made.

Appropriate organisations should be established for the planned development and management of a river basin as a whole. Special multi-disciplinary units should be set up in each State to prepare comprehensive plans taking into account not only the needs of irrigation but also harmonising various other water uses, so that the available water resources are determined and put to optimum use having regard to existing agreements and awards of Tribunals under the relevant laws."

The National Water Policy thus recommends the setting up of suitable basin level organisations for the planning and management of water resources of various river basins.

5.5 Recommendations of the Parliamentary Consultative Committee

During its deliberations on the National Water Policy in respect of setting up basin level organisations, the Parliamentary Consultative Committee of the Ministry of Water Resources constituted a sub-committee in December 1987 to examine the issues related to the form and role of the organisations to undertake the planning and development of river basins. The report of the sub-committee as approved by the Consultative Committee in May 1988 contains recommendations on the functions and powers, organisational set up and other details of the river basin organisations (RBOs).

Setting up of RBOs has been recommended in seven river basins, viz., (i) Narmada, (ii) Brahmaputra, (iii) Ganga, (iv) Mahanadi, (v) Godavari, (vi) Cauvery and (vii) Krishna.

It was noted in the report that out of the seven

basins, three basins, viz., Narmada, Brahmaputra and Ganga have already some organisations which are only to be reconstituted and that for the others, basin organisations are to be set up afresh.

Working Group also recommends creation of Subernrekha River Basin Organisation.

5.5.1 Constitution of Sub-Committee of the National Water Board

The question of establishment of RBO was further discussed in the first meeting of the National Water Board held on 27th November 1990 in which it was decided to set up a sub-committee of the Board to prepare a policy paper on the formation of RBOs. Accordingly, a Sub-Committee of the National Water Board was set up in 1991 by the Ministry of Water Resources with Chief Secretary, Govt. of Gujarat as Chairman and Secretary(Irrigation) in the States of Madhya Pradesh, Maharashtra, Arunachal Pradesh and Karnataka, Member (WP), Central Water Commission, Adviser (I&CAD), Planning Commission as Members and Chief Engineer (BP&MO), Central Water Commission as Member Secretary.

The Sub-Committee noted that the setting up of basin level organisation will facilitate the development of a basin level information system. Planning and management of water resources necessitates the collection and processing of a large volume of water resources data. At present data collection is being done by various Central and State agencies and there is not a single agency which is responsible for compilation of all the data. There is also no mechanism to facilitate free exchange of data between the various agencies which are collecting the data and the various State Governments and other user organisations. Particularly in the case of inter-State rivers, the data being collected by a State are not always freely made accessible to other States situated in the same river basin. The formulation of basin level plan even for the portion of a basin falling within a State will need the analysis of water resources data of the upstream State(s). The National Water Policy emphasizes in this respect that the prime requisite for resource planning is a well-developed information system and that there should be free exchange of data among the various agencies.

One of the primary technical functions of the RBOs will thus be the development of a network of data banks and data bases at the basin level which should be made

freely accessible to all the user agencies.

Apart from the works pertaining to development of data banks and formulation of integrated and comprehensive basin level master plans, another important work of the RBO will be monitoring of the implementation of the schemes included in the approved basin plans undertaken by the States.

The RBOs can play a significant role in catchment area treatment to prevent deterioration of the land resource by promoting appropriate preventive measures through soil and water conservation programmes on the basis of integrated watershed management. The RBOs with their inter-disciplinary team of experts can overview the plans prepared by the State Governments for catchment area treatment and watershed management and coordinate between States in respect of inter-State projects.

The rehabilitation and resettlement of project affected persons is an important environmental issue facing almost all the water resources projects, particularly multipurpose and major irrigation projects. The Sub-Committee noted that overview of the plans in respect of inter-State projects for rehabilitation of affected population and for the water related aspects of conservation of the environment will be another important work of the RBOs.

5.5.2 Functions of the RBOs

The Sub-Committee reviewed the recommendations of the Parliamentary Consultative Committee in respect of the functions of the RBOs. The Sub-Committee opines that, with a few amendments, the functions as recommended are comprehensive and adequate to fulfill the objective behind the establishment of such organisations. The proposed functions are given as given below:

1. To cause hydrological and geo-hydrological data to be collected by various State and other agencies and analyse, basinwise, these data and to determine from time to time the volume of water flowing in the main river and its tributaries in a water year taking into account withdrawals for various uses;
2. to prepare basin plans on the basis of master plans prepared by the States, i.e., to prepare and keep upto date a comprehensive plan for water and

- related development within the basin aiming at optimal use of surface and ground waters;
3. to serve as the principal coordinating agency for plans for water and related land development;
 4. to evolve ground water management policies and schedules for integrated operation of the surface and ground water systems;
 5. to evolve river management policies to regulate the flow in river channels from time to time;
 6. to overview plans for catchment area treatment, watershed management, rehabilitation of affected population and for the water related aspects of conservation of the environment for inter-State projects and projects submerging areas in other States;
 7. to have overall coordination and direction in respect of measures undertaken in the inter-State river or river valley for the purpose of:
 - (i) conservation and optimum utilisation of water resources of the inter-State rivers;
 - (ii) promotion and integrated operation of schemes for various uses like irrigation, water supply, industries, hydro-electric power, flood control, navigation, recreation and pisciculture;
 - (iii) promotion of measures for prevention of waterlogging and salinity;
 - (iv) measures necessary for conservation and upgrading the quality of the surface and ground waters; and
 - (v) such other matters as implementation of inter-State projects which may be acceptable to all the basin States.
 8. to monitor progress of major projects to ensure that due regard is given to safety of structures and environmental protection measures;
 9. to formulate and recommend policies for water management including development of cropping pattern, integrated operation of reservoirs and water budgeting in the river basins; and

10. any other matter which is supplemental, incidental or consequential to any of the above functions.

5.5.3 Powers of the RBOs

The Sub-Committee reviewed the powers of the RBOs as proposed by the Parliamentary Consultative Committee. With regard to the power proposed in respect of storage apportionment, regulation and control at various points in the river basin, the Sub-Committee is of the view that this should be restricted to overseeing of the implementation of these aspects as per the awards of tribunals or inter-State agreements, as the case may be. Regarding inspection of any works undertaken in the basin concerning the development of the inter-State river or river valley and undertaking surveys and investigations, the Sub-Committee opines that these powers need not be given to the RBOs since the RBOs would be preparing comprehensive basin plans based only on the individual master plans prepared by the States and hence would not be required to undertake surveys and investigations of their own. Other powers as recommended by the Parliamentary Consultative Committee with a few amendments can remain with the RBOs. The proposed powers are as given below:

1. conduct and coordinate research of various aspects of conservation and utilisation of water resources such as water power generation, irrigation, navigation, flood control, soil conservation and land use;
2. publish statistics or other information relating to the various aspects of the development of the inter-State river or river valley;
3. oversee storage apportionment, regulation and control at various points in the river basin as per tribunal awards and inter-State agreements;
4. require any State Govt. to furnish such information as the organisation may require in relation to:
 - (a) the projects undertaken by that State for the regulation and development of the inter-State river or river valley;
 - (b) the topographical, meteorological, hydrological, hydro-geological and other sub-soil data; and

- (c) such other matters as may be prescribed by National Water Resources Council, subject to Constitutional provisions and rights granted to States under the Constitution.

The Sub-Committee noted that it has been proposed by the Central Water Commission to set up basin organisations in respect of three river basins during the VIIIth Five Year Plan, viz., Narmada, Brahmaputra and Krishna. While for Narmada and Brahmaputra, it has been proposed to reconstitute the existing Narmada Control Authority (NCA) and Brahmaputra Board into Narmada Valley Authority (NVA) and Brahmaputra Valley Authority respectively, for Krishna, it has been proposed to set up Krishna Coordination Committee initially which can later on be converted into a full fledged Krishna Valley Authority. While as indicated in para 2.3, the reconstitution of NCA into NVA may have to be referred to the Ministry of Law, the reconstitution of Brahmaputra Board and the setting up of Krishna Coordination Committee can be taken up.

The Sub-Committee has given the following recommendations:

- (i) The basic technical functions of the RBOs will be collection of data and development of basin level information system, planning, coordination, monitoring and implementation of inter-State projects.
- (ii) The RBOs need not be set up under an Act of Parliament but through executive orders;
- (iii) The State Governments may immediately initiate action for setting up of multi-disciplinary units in their respective States for preparation of comprehensive plans for water resources development; GOI and the State Governments may share the cost equally;
- (iv) Establishing Brahmaputra Valley Authority by reconstituting the existing Brahmaputra Board and establishing Krishna Coordination Committee may be taken up during the VIIIth Five Year Plan. Reconstitution of Narmada Control Authority into Narmada Valley Authority may have to be referred to the Ministry of Law before taking a final decision.

5.5.4 Progress made so far

The Central Water Commission has prepared and circulated to all the States a publication on 'Guidelines for the preparation of River Basin Master Plans'. A pilot study has also been taken up in central Water commission for preparation of river basin master plan for the Vamsadhara Basin so that this would become model for the States to follow for the preparation of river basin master plans. As a follow-up action to the recommendations of the National Conference of Irrigation and Water Resources Ministers of States/UTs and to the later formulation of National Water Policy, the Ministry of Water Resources and Central Water Commission are pursuing the matter of preparation of basin plans with all States/UTs. A statement giving the status of preparation of master plans by States/UTs is enclosed at Appendix V.

It may be observed from the statement that the response from the States is very poor except from the States of Goa, Karnataka, Kerala, Rajasthan, Nagaland and the UTs of Dadra and Nagar Haveli, Lakshadweep, Chandigarh and Andaman & Nicobar Islands.

It can be construed from above that progress on formulation of River Basin Master Plans is very slow. During the recently held third meeting of the National Water Resources Council, divergent views were expressed by various States regarding setting up of River Basin Organisations. However, it is proposed that River Basin Authorities for selected river basins may be constituted for preparation of River Basin Plan and subsequent implementation and operation of water resources development schemes in the basin.

Appendix- v

S.No	Name of State/ Union Territory	Status of setting-up of multi-disciplinary units	Status of preparation of river basin master plans
1.	Andhra Pradesh	Not set up.	No communication received.
2.	Arunachal Pradesh	Not set up.	No communication received.
3.	Assam	Not set up.	The matter is under correspondence. No report received
4.	Bihar	Not set up.	State govt. has reported that the master plans have been prepared
5.	Delhi	Not set up.	No communication received.
6.	Goa	State Govt. has reported that there is no need to set up multi-disciplinary unit in the State.	State Govt. has reported that the master plan for the whole state has been prepared but CWC has not received.
7.	Gujarat	Not set up.	State Govt. has informed that work of preparing master plans has been taken up for four basins in the State.
8.	Haryana	Not set up.	State Govt. has replied that the master plans are under preparation
9.	Himachal Pradesh	Not set up.	The matter is under correspondence. No report received
10.	Jammu & Kashmir	Not set up.	No communication received.
11.	Karnataka	Multi-disciplinary unit has been set up.	Comprehensive Irrigation Master Plan prepared by the Expert Committee and is under consideration of the State Govt.
12.	Kerala	Multi-disciplinary unit has been set up.	State Govt. has reported that the master plans are under preparation.
13.	Madhya Pradesh	Not set up.	State has reported that the indicative master plans have been prepared for various sub- basins. Only the indicative master plan for Betwa basin (including Jamni & Dhasan sub- basins) received by CWC. Comprehensive master plans are still to be prepared for all the river basins.

S.No	Name of State/ Union Territory	Status of setting-up of multi-disciplinary units	Status of preparation of river basin master plans
14.	Maharashtra	State Level Project Appraisal Committee will also deal with the preparation of master plans.	The matter is under correspondence. Master plan for Konkan region received but the report is in marathi.
15.	Manipur	Not set up.	State Govt. has reported that the master plans are under preparation.
16.	Meghalaya	Not set up.	State Govt. has reported that there is no river basin in the State which qualify for taking up a master plan.
17.	Mizoram	Not set up.	No communication received.
18.	Nagaland	Not set up.	State Govt. has reported that as there are no major river basins in the State, it is not possible to prepare basin-wise/ sub-basinwise master plans. However, a general master plan for water resources development in the State will be prepared during the 8th Plan by WAPCOS.
19.	Orissa	Not set up.	State Govt. has reported that the basin-wise master plans prepared are print.
20.	Punjab	Not set up.	The matter is under correspondence. No report received.
21.	Rajasthan	Not set up.	State Govt. has prepared a master plan for development of surface water resources for irrigation. Comprehensive master plans still to be prepared.
22.	Sikkim	Not set up.	No communication received.
23.	Tamilnadu	Not set up.	State Govt. has reported that the master plans are under preparation by the Institute of Water Studies.
24.	Tripura	Not set up.	The matter is under correspondence. No report received.

S.No	Name of State/ Union Territory	Status of setting-up of multi-disciplinary units	Status of preparation of river basin master plans
25.	Uttar Pradesh	Not set up.	A perspective Plan (Indicative) for development of irrigation in U.P. up to 2020 AD and separate master plan for hydro-power projects have been prepared by the State Govt. Comprehensive master plans are still to be prepared.
26.	West Bengal	Not set up.	A Perspective Plan for development of irrigation in West Bengal was received. Comprehensive master plans still to be prepared.
27.	Andaman & Nicobar Islands	Not set up.	No communication received.
28.	Chandigarh	Not set up.	The UT Administration has informed that no river flows through the UT. As such, no master plan is required to be prepared.
29.	Dadra & Nagar Haveli	Not set up.	No communication received.
30.	Lakshadweep	Not set up.	The matter is under correspondence. No report received.
31.	Pondicherry	Not set up.	Water Resources Plan has been got prepared by WAPCOS.

CHAPTER VI

STRATEGY AND MEASURES FOR IMPROVING THE EFFICIENCY OF EXISTING IRRIGATION SYSTEMS.

6.1 INTRODUCTION

The modernisation of irrigation projects inter-alia would mean upgrading the existing irrigation system by modernising and remodelling the same keeping in view the experience gained and the deficiencies felt in running the system over the past few years in order to derive optimum benefits for the present day irrigated agriculture.

While undertaking the modernisation of existing irrigation projects, the differentiation between restoration or rehabilitation vis-a-vis modernisation needs to be understood and spelt out. The restoration or rehabilitation of irrigation project may include the works required to bring the system to the originally designed parameters i.e. restoring the system to original sections and the canal capacities etc. The modernisation would be updating and improving the existing system to meet the present day demand or irrigation. The old system which were designed for traditional crops may be found wanting to meet the new enhanced requirements of high yielding varieties of crops. Moreover, the old system were mostly designed for protective irrigation. In order to meet the rising demand of foodgrains, the concept of irrigation has undergone a major change from protective to productive irrigation. The productive irrigation implies that for any unit of water supply on a unit of land, the production should be optimum. Due to inadequate maintenance of the system for want of adequate funds, these have deteriorated and are required to be rehabilitated/restored in the first instance. While taking up the restoration work, considering present day needs, it would also need to be modernised considering all aspects. Modernisation would comprise adopting measures like selective lining of reaches having high seepage losses, providing adequate gates/cross regulators, construction of water courses and field channels etc. As such while taking up of the projects for modernisation this would invariably have to include restoration and rehabilitation component also and it may be difficult to separate out the two viz restoration and modernisation even though these are two separate identity.

Most of the existing irrigation systems in the country were planned with unlined canal system for traditional cropping pattern and assumed irrigation efficiencies. These systems are therefore, not able to cope up to the modern day agriculture and a lot of deficiencies like seepage losses, inadequacy of systems/canal structure to meet higher demands have been noticed. Modernisation of irrigation system does not mean merely improvement of the engineering parameters such as lining of canal and distribution systems. improvement and

* Report of the Sub-group for TOR(vi)

modification of structures but also application of a complex combination of field disciplines to irrigated agriculture. As such the modernisation covers not only engineering aspects of irrigation system but also agronomic and management aspects. The modernisation of irrigation system is a comprehensive term which may include review of cropping pattern, crop water requirement, irrigation deficiencies of field application. The need for upgrading the system including remodelling/ re-sectioning, re-aligning of canal if needed, maintaining of required L Section and X section of the canal, and canal banks/berms. This would also include review of Hydrological parameters like river inflows, floods, sedimentation etc. The inadequacy of canal structure like Cross-regulators etc. and O&M grants also needs to be reviewed. Above mentioned deficiencies may have to be identified keeping in view the particular project's health and requirements.

Efforts made in the recent past to achieve the objective of the better water use and system improvement and rehabilitation are taking up of the National Water Management Projects and Water Resources Consolidation Projects with the financial assistance from World Bank. Phase I of the National Water Management Project covered 114 schemes with an area of 33.48 lakh ha. with an estimated cost of Rs. 587.81 crores in 11 states. The Phase II of the projects is likely to be taken up during this year and is likely to continue in IX Five Year Plan. The Water Resources Consolidation Projects taken up are as under:

States	Estimated cost (in Rs. Million)	Area benefited. (ooo Ha.)
Orissa	9770	329
Tamil Nadu	8075	533
Haryana	14421	113

Similar projects are likely to be taken up in some of the other states like Rajasthan, U.P. etc.

6.2 The discussions and recommendations with regard to the broad functions of the Sub-Group are as under :

6.2.1 To recommend the strategy and measures for improving the efficiency of the existing irrigation system including the programme of modernisation of the old irrigation projects with a view to turn over these systems to WUAs under broad strategy of Participatory Irrigation Management.

Before deciding the strategy and measures for improving the efficiency through modernisation of the system, it is necessary that diagnostic analysis or performance evaluation of the project is carried out. The parameter for the performance evaluation should cover the techno-economic as well as Socio and agro-economic parameters. As the cause or problems for deficiency would differ from project to project, solution or measures for improving the water use efficiency under the

project would also be different. So the results in each case of the evaluation would guide the proper measures required to be taken for improving the particular irrigation system.

Under the participatory irrigation management it is envisaged that system upto minor level or below would be turned over to the Farmer's Associations for Operation and maintenance. The headwork and the main system would continue to be with the Government for maintenance and operation. Although, ideally the systems may have to be in perfect condition before these are handed over to the Farmer's Associations, practically it may not be possible and feasible do so in all cases. As such, it is recommended that the systems should be in reasonably good or running condition before these are handed over to Farmer's Associations for O&M. Complete and full restoration of the system may not be a pre-condition for handing over.

6.2.2 To recommend specific items of work to be taken up under modernisation during the IX Plan taking into account the guidelines for modernisation of projects already issued by CWC.

The guidelines for modernisation of the projects, formulated by CWC inter-alia included the various items viz Hydrology, land potential, cropping pattern, crop water requirements, canal system, ground water, drainage, water management and environmental management, economic evaluation, training facilities etc. Though these are essential for preparation of the project for modernisation, it is felt that operational plan for better water use should also be prepared. Also while formulating the modernisation project, the Participatory Irrigation Management should also be included.

As already pointed out, the modernisation does not cover only the improvement of the engineering system but the agronomy and water management system also. As such the concept of taking up Water Resources Consolidation projects (which aim at system improvement, rehabilitation and modernisation and turnover to farmers and water planning, environmental management, research and training etc.) which have already been taken up in Haryana, Tamil Nadu and Orissa, be extended to the other states.

Also, in view of the advantages obtained through the National Water Management Project Phase- I it is recommended that increased number of irrigation projects in different states be included in the National Water Management Project Phase II.

6.2.3 To recommend changes required in the irrigation practices and procedure in consonance with the requirement of modern agriculture.

In the modern irrigated agriculture use of high yield variety of seeds and high inputs of chemicals and pesticides is involved. The optimum benefits are achieved only when the irrigation water is supplied as and when required and in the requisite quantity. This involve the judicious use of available ground and surface water for optimum benefits. To achieve the objectives of improved productivity and better

water use and management, farmers involvement in the operation and management and adopting proper water planning and management practices alongwith resorting to modern irrigation methods like Sprinkler and drip etc. wherever feasible is required. Integration of these methods with surface system would also help to achieve these objectives. To sum up, the conjunctive use of surface and ground water and improved methods of sprinkler and drip may have to be increasingly followed.

6.2.4 To recommend priority to be taken to modernisation schemes in the IX Plan in various states taking into account the progress of creation of potential upto the end of VIII Plan.

The need for modernisation/ remodelling of existing irrigation system to meet the demand of maximum irrigated agriculture may be more in the states like Tamil Nadu, A.P., Kerala, Punjab and Haryana etc. who have more or less achieved their anticipated ultimate irrigation potential. The need for the same in the states like M.P. and Maharashtra who are still in the process of developing their irrigation potential may be less. However, keeping in view the need for modernisation an inter-se priority of schemes in a state may be decided by the concerned state Govt. for implementing the programme. Large old projects may be considered for modernisation in phases depending upon the availability of resources. Due to constraint of resources it would also be advisable to take up the schemes for implementation in phases.

The modernisation schemes which can be taken up during the IXth Plan is given in the State Plan Proposals for IXth Plan [Item III (C) of Annexure III(1)]

6.2.5 To recommend the essential items of works to be taken up for modernisation and particularly the necessity or otherwise of lining the entire canals and distribution systems.

While formulating modernisation proposals following aspects would need to be taken care of:

a) Lining

Lining of canal/distribution system to save seepage losses and to maintain proper section of water carrier system is generally undertaken. However selective lining in the reaches having high seepage losses or saline ground water only should be considered for lining. Blanket lining of system as a whole need not be taken up since seepage losses of the irrigation water may actually be recharging the ground water potential which may be underuse through dug-wells/tubewells for meeting the local needs of water supply and irrigation.

b) Canal Structures

Adequate number of cross-regulators, escapes and outlets may need to be provided so that canal flows can be regulated properly to supply irrigation water to entire command. These will also include adequate provision for controlled outlets so that suitable account of water release, for irrigation, could be maintained.

c) Hydraulic Survey of Irrigation System/Restoration

Hydraulic survey of irrigation system is required to be undertaken to identify the extent of resectioning/remodelling of canals and canal berms / banks. This would help in firming up proposals for restoration of canal system.

d) Review of Cropping Pattern

The cropping pattern is an important item in the irrigation project since the agriculture productivity depends upon adoption of suitable cropping pattern. Also the cropping pattern is not static but dynamic. It changes on account of varying requirement of agricultural products and market demands. Therefore, in modernisation schemes, the designed cropping pattern may be carefully reviewed and cropping pattern adopted after considering these parameters and also soil irrigability and water availability in the commands, in consultation and involvement of beneficiary or farmers associations.

e) Review of Crop Water Requirement.

It has generally been experienced that whatever delta/crop water requirements were assumed at the time of planning of the project initially were later found to be inadequate due to various factors such as use of high yielding varieties of crops, changes in base periods, losses etc. Therefore, the same needs to be re-assessed, keeping in view agro-climatic condition of the command/area and the experience gained.

f) Use of Plastics for lining and distribution system.

In the recent past use of plastics has come up on a large scale in irrigation system. The use is mostly in the shape of LDPE Film for lining and plastic or PVC pipes for distribution system. Wherever feasible, use of plastic pipes or LDPE/HDPE lining, while framing modernisation schemes may be considered.

g) Conjunctive Use of Surface and Ground Water

In an existing irrigation system the continuous application of irrigation water in command area helps in generating good ground water potential. This helps in planning of conjunctive use of surface and ground waters for optimum use of available water resources. Such use not only restricts adverse affect of irrigation like water-logging and salinity etc., but also assists in increasing the quantum of overall water- resources availability and thereby helps in increasing irrigated area or irrigation intensity and maintaining water balance in the command area.

The need for conjunctive use is well recognised and is also advocated in the National Water Policy. Central Water Commission have recently formulated and circulated "Guidelines for Planning of Conjunctive Use of Surface and Ground Water in Irrigation Projects". These guidelines will assist the states in planning of conjunctive use of surface and ground waters.

Conjunctive use of surface and ground water should therefore be an essential part, while preparing modernisation proposal.

However, it is felt that the aspect of conjunctive use of surface and ground water in the command area of the existing irrigation project could, preferably be left to the beneficiaries who may undertake the same either individually or through a group of cultivators/ farmers (water user's association etc.). This, in addition to resulting in cooperative spirit among the cultivators, would also result in reduced governmental expenditure on this aspect.

The conjunctive use however needs to be permitted formally in the irrigation commands and accordingly wherever necessary suitable amendments need to be incorporated in the Irrigation Acts and Rules of the States. The relevant Irrigation Policy also needs to be formulated to encourage judicious conjunctive use by the beneficiaries.

h) Drainage.

The need for drainage alongwith irrigation in irrigation commands where the irrigation water is supplied without taking adequate care for draining off surplus surface water has been well recognised particularly in commands where there is no natural drainage. Provision of adequate drainage facilities therefore, has to be made after proper investigations, in modernisation proposals.

i) Use of latest Irrigation methods.

Use of sophisticated latest irrigation systems like drip and sprinkler which help in application of required quantity of water to the plant and result in saving and higher yields need to be adopted wherever feasible separately and also in integration with surface systems. Govt. subsidies available for such systems should help in their increased adoption.

Adoption of the new systems should be taken up by the farmers individually or in cooperative way but the modernisation project should not be burdened of providing these systems. The measures necessary to facilitate the adoption of these systems should be incorporated in the Modernisation proposals. Economic Analysis should be done independently for both without and with these systems and indicated in the Modernisation proposals.

j) Restoration of dams/head work.

While undertaking modernisation of existing irrigation systems it will also be necessary to ensure that restoration of the dams and headworks is also considered and suitable provisions, as may be required are made in the overall modernisation proposal. Such works may involve remedial works for wear/tear and normal ageing of the structures plus improvement/renovation works as may be required.

k) Participatory Irrigation Management and turning over irrigation system to WUAs.

Irrigation Management has become a matter of concern for planners, engineers, farmers and as well as politicians. It has been recognised that farmers will have to be potential

managers and, if organised, the farmers are in a position to manage the systems. Hence, Participatory Irrigation Management has become increasingly important in the context of present deteriorating situation in irrigation services. Their involvement in planning, operation, maintenance and management of systems is considered necessary.

The Ministry of Water Resources (MOWR) have circulated guidelines on participatory management. The states have accordingly to formulate their policies to transfer the irrigation management to farmers, of the systems at minor level and below.

The State Govts. of A.P. Gujarat, Maharashtra, Orissa and Tamil Nadu have prepared Action Plans for Participatory Management, but still keeping in view of past experience vigorous efforts would be needed to make the programme successful.

However, before handing over the irrigation system to farmers it would be obligatory on the part of the Govt. depts. concerned that the system is in good shapes and in running condition.

The Participatory Irrigation Management and turning-over-the-system-to-farmers should invariably be included in the Modernisation proposals.

(I) Since modernisation will be resulting in enhanced benefits to the farmers' community who have already gained from the increased agricultural production through the existing irrigation system, it is logical that some share cost of the modernisation of the system should be shared by the farmers themselves, who in the long run would gain through enhanced and assured supply of irrigation water which would result in increased agricultural productivity and consequently financial gain to them. Their involvement and participation right from initial stage seems necessary.

m) Economic Analysis

The project report for modernisation of existing irrigation system have to be prepared as per the prescribed guidelines. In the guidelines, all details regarding data and information required to be included in the modernisation project reports have been identified and listed. Each modernisation projects needs to be examined and its techno-economic viability would need to be established, before these are considered for approval and implementation.

In some cases wherein the replacement of age-old structures like existing weirs barrages are proposed, there may be no need to establish the economic viability. In such cases, it is presumed that if these works had not been replaced, the whole system of irrigation would have collapsed. The philosophy had already been accepted in the cases of replacements of existing Bhim Goda weir at Haridwar on river Ganga, Okhla weir in Delhi on Yamuna river and in Birupa/Jobra weirs in Orissa on Mahanadi Godavari barrage on river Godavari.

11.2.6 To suggest measures for promoting equitable distribution of water in the entire command of the irrigation projects.

a) National Water Management Project.

The National Water Management Project (NWMP) which aims at increasing productivity and farm incomes in existing irrigation schemes through a more predictable, reliable and equitable irrigation service was taken up in 1991-92 with World Bank assistance. 114 schemes covering an area of 33.48 lakh ha. with an estimated cost of Rs. 587.81 crore have been taken up for implementation under the NWMP in 11 States. As many as 44 such projects were to be completed by the end of March, 1995. The remaining 70 schemes are in various stages of implementation and would spill over to next phase. Schemes which have been completed or are nearing completions have shown increase in productivity ranging between 15 percent and 57 percent per hectare of land through additional irrigated area and better water use efficiency and have also created conditions for equitable distribution of irrigation water.

In view of the usefulness of the project, it is proposed to take up second phase of NWMP. The proposed NWMP-II would cover balance works of ongoing irrigation schemes under the current Phase- I and also additional irrigation schemes in various states.

b) Water Resources Consolidation Projects.

During later part of the Eighth Plan, Water Resources Consolidation Project (WRCP) have been taken up in the States of Haryana, Tamil Nadu and Orissa with financial assistance from the World Bank. These projects aim to improve the productivity and sustainability of irrigation sector, to introduce multi-sectoral water planning, to integrate farmers in irrigation management and to strengthen the state's institutional and technical capabilities in Water Planning, development and management. The major aspects covered under these projects are systems improvement, Rehabilitation and modernisation of systems, turnover to farmers associations, completion of schemes, water and environmental management and research etc.

Keeping in view the advantages and the components of schemes as mentioned above it is recommended that the similar schemes may be formulated and taken up by other states also.

In general it is recommended that the concept of NWMP and WRCP be fully supported and extended to the other states for implementation in the IXth Plan.

c) Equity in distribution of irrigation water

In order to ensure that the benefits of irrigation reach - every farmer in the command area, it is necessary that available resources are distributed to all such farmers ensuring that benefits reach equally to all. In this context formation of WUAs can help a lot. The irrigation supplies could be made in bulk to such WUAs all over the command and these associations could then reallocate the irrigation water to all farmers in WUAs. By adopting this the problems of head enders vis-a-vis tail enders could also be avoided. For this purpose, farmers should be induced to form cooperatives/outlet committees who will be fully associated not only with the implementation of the programme but also undertake

responsibility for providing inputs for irrigated agriculture and for marketing of the produce. The farmer's associations and cooperatives established in some parts of the country have been successful in the equitable distribution of water among their members, the bulk of water supply being given by the Irrigation Department to such cooperatives.

6.3 Summary of recommendations.

1. Performance evaluation of Projects be carried out before formulating modernisation schemes.
2. For turning over the minor level systems to Farmers Associations, systems should be in reasonably good shape and running condition.
3. Adoption of other modern methods like Sprinkler and drip, separately and in integration with the surface systems may be considered in the modernisation proposals.
4. Alongwith following the guidelines for preparing modernisation projects, preparation of operational plans and PIM should be included in modernisation projects.
5. Rehabilitation/Restoration of projects may form part of modernisation. The aspects to be included in modernisation proposal are - Selective Lining, restoration of dams/headworks and canal systems, PIM, review of cropping pattern and cropping pattern, use of plastics, Conjunctive Use of surface and ground water, drainage and use of Sprinkler/drips etc.
6. Rotational water supply system with suitable operational or scheduling needs to be followed for equitable distribution. For equitable distribution PIM should be ensured.
7. WRCP's may be taken up in other states. NWMP should be adopted and extended in IX Plan.
8. Due to constraints of resources, modernisation schemes may be taken up for implementation in phases.
9. Though conjunctive use should form part of the modernisation project, this aspect could be left to the farmers' or their associations.
10. Economic analysis for replacement structures may not be necessary.
11. Cost of modernisation should be shared by beneficiaries through their associations. Their involvement right from planning stage is necessary.

CHAPTER VII

REVIEW OF O & M AND WATER RATES AND PEOPLE'S

PARTICIPATION IN IRRIGATION MANAGEMENT

7.1 INTRODUCTION

The total plan expenditure on irrigation sector since the inception of First Plan till 1993-94 at 1980-81 prices has been Rs. 58307.3 crores including an amount of Rs. 35325.9 crores for major and medium irrigation projects which works out to 60.58% of total plan expenditure on irrigation. From the data available it is seen that the loss incurred (Gross Receipts -working expenses) on irrigation and multipurpose river projects at 1980-81 prices during 1974-75 was Rs. 252 Crores and recovery accounts for only 64.2% of working expenses and the loss in 1989-90 was Rs. 1113.4 crores and recovery accounts for only 9.3% of the working expenses. It is clear from the above that there has been a fast deterioration in the financial management of the public irrigation system. The data available for 1989-90 on working expenses and gross receipts per hectare of potential utilised of irrigation and multipurpose river projects calculated on the basis of water rates prevailing during 1989-90 was Rs. 873 per hectare and Rs. 82 respectively.

The above situation has arisen mainly due to under pricing of irrigation water, infrequent revision of water rates, poor recovery of whatever low irrigation charges have been levied and event writing off and remission of water charges. During the British Rule in India irrigation projects were treated in general on par with any other commercial venture and hence a minimum rate of return on the invested capital was ensured. After Independence the emphasis was shifted from treating the irrigation projects from commercial considerations to viewing it as a net addition of agricultural output to the national economy. Though the project authorities have to give the financial rate of return calculation statement also in the project report, sanction was not held up if the project did not satisfy the financial rate of return criterion. The financial rate of return calculation was only to give an indication to the Planning commission to insist on the states to enhance their water rates so that the States were able to meet the O&M expenditure and also earn a surplus for further reinvestment in irrigation projects. It seems, due to various considerations the Planning Commission could not achieve its objective of making the states revise the water rates periodically.

7.2 Existing Water rate structure and the Need for its Rationalisation

There are wide variations in water rate structures across states and the rate per unit volume of water consumed varies greatly across crops. In some states the irrigation charges vary from project to project depending on the mode of irrigation. There are no uniform set principles in fixing the water rates and a multiplicity of principles are followed such as recovery of cost of water, capacity of irrigators to pay based on gross earning or net benefit of irrigation, water requirement of crops, sources of water supply and its assurance, classification of land linked with land revenue system and combination of various elements. In some states water cess, betterment levy, etc. are also levied. According to the Report of the committee on pricing of Irrigation Water of the Planning Commission of 1992 constituted under the Chairmanship of Dr. Vaidyanathan, water rates are a form of users charge and not a tax and hence users of public irrigation must meet the cost of the services.

Irrigation is one of the key inputs for crop production and hence pricing of this input is one of the first steps and integral component in the process of rationalising the totality of the price structure and raising the efficiency of water use. The under pricing of water adversely affects the availability of resources for the management of irrigation systems. Inadequate allocation for maintenance and repairs acts as a direct consequence of the poor financial position of the states and is responsible for the low, possibly deteriorating quality of services. This means that potential increase in productivity which new technology makes possible cannot be realised in full. A revision in the level and structure of water rates is thus necessary in the interest of both efficiency and equity. The revision should be such as to achieve full cost recovery in due course and in the process promote saving, create disincentives for wastes and thereby enable the service area to be expanded and a more reliable service assured. Revision of water rates should go hand in hand with measures to improve the quality of services and to keep a check on costs. In the light of a detailed assessment, rates for non agricultural uses of water such as domestic and industry should also be revised so that the costs are fully recovered and arrangements built into supply contracts for ensuring full and prompt recovery of dues. Cost recovery should be the main consideration governing rate determination. Rates should be based on O&M norms and capital charges (interest and depreciation). Some sort of averaging of rates by region and/or category of projects

is desirable. There should be two part tariff: a) a flat annual rate on per hectare basis and b) variable rate linked to actual expenditure of service (volume or area). Rate as per volumetric basis could be assessed for only group of farmers. The Committee has also suggested rationalisation of fixing of water rates etc. in three stages. The objective of the first stage should be to rationalise and simplify the existing system of assessment (based on cropwise irrigated area on an individual basis) to a system of season specific area rates. It is possible to estimate the relative water consumption per hectare irrigated in different seasons. The variable part of the tariff in the case of major and medium projects should be fixed on this basis. In the second phase the aim would be to shift to a fully volumetric system. Additional investment to modify the distribution system for effective regulation of volume delivered at outlets will be needed. As system efficiency and productivity improve, the targets of cost recovery can be progressively increased. Volumetric system of charging is best decided in consultation with the Water Users Association. Phase-III which will be spread over much longer period should seek to extend and consolidate the system of Farmers Group Management and implement with the involvement and participation of such groups, a programme for upgrading the system to a higher level of efficiency in water use and therefore of productivity. Besides substantial investment in conjunctive use and distribution networks, the techniques of water management will have to become tighter and more sophisticated.

7.3 O&M Expenditures

At present the funds allocated for O&M are inadequate and hence the whole or a substantial part of the receipts from each irrigation system towards the O&M of the system should be earmarked. In the long run each irrigation system should be converted into an independent self financing system through the formation of WUAs or cooperatives or corporations etc. The departments should transfer the maintenance of the irrigation network below a certain level of outlet to WUA. This would reduce costs and enable the departments to concentrate on the maintenance of main system and perform that function better. If we wish to switch over to group based delivery it will be necessary to clear the backlog of deferred maintenance and to upgrade the main system to bring it to the desired standards. The Vaidyanathan Committee recommended that at least 10% of the plan provision for major and medium projects should be allocated for renovating the existing systems and the recovery of accumulated arrears should be earmarked towards improving the cost of deferred

maintenance/special repairs in the project concerned. The

Committee also recommended the methodology adopted in working out O&M norms for projects in U.P. and for Jayakwadi Project in Maharashtra. It also recommended that staff cost should be brought down substantially. One of the effective ways of cutting cost is to transfer some functions to WUA. It has also been stated that it will be useful if the CWC could undertake a systematic and comparative study of the existing norms and the actual situation on the ground in all the major states. The states should form a high powered autonomous board which may be called "Irrigation and Water Pricing Board" (IWPB) to review the policy establishing the norms regarding maintenance cost for various components and staff costs, assess the actual expenditure in relation to these norms and determine the parameters and criteria for reviewing the water rates. There should be mandatory review of all these matters every 5 years with an opportunity for users to present their views.

7.4 SALIENT FEATURES OF THE REPORT OF THE GROUP OF OFFICERS CONSTITUTED BY THE PLANNING COMMISSION TO GO INTO THE RECOMMENDATIONS OF THE COMMITTEE ON PRICING OF IRRIGATION WATER.

However, the Planning Commission constituted a Group of Officers on 22.12.92 under the chairmanship of Secretary, Planning Commission to have a collective consensus on the basic issues on the recommendations of Dr. Vaidyanathan Committee on Pricing of Irrigation Water. The Group of Officers Committee while submitting its report on 23.12.1994 has mentioned that there was total convergence of views as well as unanimity that full O&M cost must be recovered in a phased manner, i.e. in next five years starting from 1995-96 taking into account the inflation also. The Group of Officers Committee recommended the following formula.

$$X_y = X_0 + \frac{\{ (O - X_0) (1 + I_y/100) \}}{(P - Y)}$$

Where,

X_y = Water Rate to be adopted/revised in a particular year

X_0 = Water Rate in previous year of the intended revision

O = O&M Charges at the beginning of total revision intended i.e. base year for intended total revision against the pre-determined time frame

Y=Particular year considered for revision of water rate

P=Total period of time in years over which full revision in water rates is to be achieved plus one

I_y =Inflation rate (as present) considered for the particular year for revision.

Note : The illustration of calculation of water rate is at Annexure VII-1

After achieving O&M level in five years, individual states might review the status to decide appropriate action to enhance the water rates to cover 1% of capital cost also.

The Group of Officers Committee has also recommended that the concept of two part tariff system as recommended by Dr. Vaidyanathan Committee on Irrigation Water Pricing is not feasible but prefers a suitable formation of irrigation water pricing structure that can take care of the Committee's recommendation in totality as per the conditions prevailing in each State.

In the Group of Officers Committee the State representatives felt that if the recommendations for upward revision of water rates is circulated from the Planning Commission, it could have more weightage in its implementation. The Group recommended further action by the Planning Commission in this regard.

Except the above suggestion/modification/recommendations the Group of Officers Committee has accepted the recommendations of Dr. Vaidyanathan Committee report.

7.5 Recommendations of the 10th Finance Commission Major and Medium Irrigation

The losses incurred by irrigation projects have continued to mount. They have increased from Rs. 467 crores in 1987-88 to Rs. 881 crores in 1992-93. Presently, the receipts from irrigation projects are not only meagre but they constitute a negligible proportion of the value of produce per ha. of irrigated area. Receipts seem to be quite insensitive to the very substantial gains in agricultural productivity in irrigated tracts. The Vaidyanathan Committee on pricing of Water has referred to an assessment that indicate that the gross receipts per ha. for major and medium irrigation projects are less than 3% of the value of produc-

tion. They are also less than 5%, except in two states, of the difference in the value of output per ha. in irrigated and un-irrigated areas. Obviously, the states have not succeeded in capturing the gains from higher productivity in terms of better irr. receipts. The Vaidyanathan Committee has made a number of recommendations in this regard which should be given urgent consideration. We are of the view that the irr. receipts should cover not only O&M costs but also give a return of at least 1% per annum on capital. We suggest that the state governments should strive to achieve this goal during the forecast period. In the assessment of forecasts only such receipts as are sufficient to meet O&M charges are included. For the hill states 75% of the O&M expenditure on the unutilised potential is assumed. Receipts have not been assumed from the unutilised potential for any state.

7.5.1 Major and Medium Irrigation Works

The 9th Finance Commission adopted a norm of Rs. 180/ha. for the utilised potential and Rs. 60/ha. for the unutilised potential. The norms for hill states were higher by 30%.

In view of the price rise and other changes during 1990-95, we have adopted a norm of Rs. 300/ha. for the utilised potential and Rs. 100/ha. for the unutilised potential. We have also accepted norms which are higher by 30% for hill states. We have provided for suitable increase in the norms in each year of the forecast period to insulate them against inflation.

We are quite concerned about the very high % of unutilised irrigation potential in certain states. Non-utilised capacity whatever might be the cause is an avoidable wastes which we can ill-afford. Accordingly we have assumed that in states where the utilisation of potential is 90% or more, there would be no unutilised potential by the year 1999-2000. For those which have a utilised potential between 75% and 90%, we expect the levels to rise to 95% by 1999-2000. For the rest, we expect the utilisation to rise to 90% by the terminal year of the forecast period.

The requirement for maintenance expenditure for each of the years 1995-96 to 1999-2000 has been worked out on the basis of the data regarding utilised and unutilised potential obtained from the Planning Commission and the norms assumed by us.

When the irrigation projects are submitted by the State Government to the CWC for technical approval, O&M expenditure @ Rs 180 per hectare for new projects are included for Benefit Cost Ratio Calculation. An amount of Rs. 180 per hectare towards O&M expenditure was suggested by the Ninth Finance Commission. The Tenth Finance Commission has suggested an amount of Rs. 300 per hectare. The Planning Commission while holding discussions with the State Irrigation Departments may ensure that the amount as proposed in the project are actually spent. This could be done by the CWC also while carrying out the monitoring exercises on the implementation of the project.

WRCP as a Model of Self Financing Project

The 10th Finance Commission has expressed concern over rising interest payments and the growth of wages and salaries, which have come to be regarded as committed expenditure and the maintenance expenditure has been treated as residual item. As a result most assets like power stations, irrigation systems etc. are operating at the levels much below the capacity on account of poor maintenance and continued neglect. In an effort to project larger outlays inadequate provision is made for crucial expenditure like maintenance of existing assets which are in current practice regarded as non plan expenditure and hence of lower priority. New schemes take priority over maintenance resulting in sub-optimal use of resources. It has also been stated that such a bias arises at least in part from the artificial classification of expenditure between plan and non plan and the attitude of regarding all non plan expenditure as of low priority.

It needs to be appreciated that a large part of non plan expenditure is of a developmental nature and should enjoy the same priority if not higher, as new plan schemes. The Finance Commission also emphasised that resources are not diverted from the purposes for which they are allocated. It has cited the example of money meant for flood relief being used for building a sports stadium which exemplifies the extent to which fiscal discipline is eroded. It has recommended that the Comptroller and Auditor General of India should constitute a Task Force to identify lapses from the prescribed norms and procedures and initiate corrective action. It has also recommended that the State Governments should ensure that the provisions for maintenance are made in accordance with their recommendations. They further recommended that a high powered committee chaired by the Chief Secretary and with Secretaries of State Governments concerned in the department of finance, planning, irrigation and PWD

and the concerned Chief Engineers of the works Departments should review every quarter the allocation and utilisation of funds provided for maintenance. In consonance with the views expressed and the recommendations made by the 10th Finance Commission the water resources consolidation projects have been recently taken up by the State Governments. The Government of Haryana first submitted WRCP proposal and this was followed by the Tamil Nadu WRCP and Orissa WRCP. The WRCP is a State wide programme aimed at improving the productivity and sustainable irrigation through multi-sectoral water planning, integration of farmers in irrigation management, strengthening of states' institutional and technical capabilities in water planning, development and management. In some of the states, irrigation departments were part of the PWD department till recently. Now in most of the states the irrigation Departments have been reorganised. A separate Water Resources Organisation has been created in many of the states. In order to progressively increase the involvement of the farmers from consultation to active management of O&M below the structural level farmers' organisations are formed. In Tamil Nadu a three tier farmers' organisations are proposed to be developed. At the lowest level (40-50 ha.) would be outlet level organisation, i.e. "Sluice Committees". Second level would be farmers' council at distributary level (about 500-700 ha.) which will be the main interaction between water resources organisation and farmers. Third level would be an apex Committee at the scheme level for consultation and agreement on overall water management issues.

During Stage-I farmers' councils is formally established as registered societies and enter into a memorandum of understanding with the Water Resources Organisation. The councils would also collect from their members a membership fee to be put into a council bank account. The interest earned would substantially pay the council's annual cost of maintenance below the distributary head, which would be their responsibility. Formal turnover of O&M responsibility to Farmers' Councils would be accompanied by extensive training and also involve an interim period of 6 to 9 months of joint management. In the stage-II at distributary level, improvements would be made after the formation of Farmers' Organisations and their acceptance of O&M responsibilities including financing after the investments are completed. Selective canal lining in Stage-II would be taken up as a joint improvement programme where Farmer's contribution would be 20% of the cost of lining. Farmer's contribution would be paid into council bank accounts to further capitalise their capacity to undertake O&M and improvement works in the future.

The WRCP also envisages management of O&M programme by WUA. The WRO's Irrigation Management and Training Institute (IMTI) would act as a nodal agency for providing training in technical aspects of systems improvements, O&M, etc. The IMTI would involve other training and research institutions and NGOs as well as private consultants with experience in farmers' organisations. A water Research Fund is also proposed under WRCP to undertake high quality applied research relevant to the states' present and future water resources planning which include mainly linkages between agriculture, irrigation, forestry and land use, water resources allocations, water markets and water prices, ground water regulation and pricing, farmers and locals participation in water management and system turn over, role of women, marginal farmers and other target groups in water management and system turnover, water efficient irrigation systems and new technologies. Much attention is also being paid to water resources research by various states' WALMIs, Central Government Institutes, including ICAR family of institutes, INCID etc.

In the WRCP periodic upward revision of water rates is mandatory for further disbursement of funds. The Governments of Haryana, Tamil Nadu and Orissa where WRCPs are sanctioned and under implementation, have signed the Memorandum of Understanding that the State Governments would revise the water rates upward annually. As per Haryana WRCP during the 7 year implementation period 30% of O&M Cost will be recovered from the farmers by 1st April, 1995, 50% by 1st April, 1996, 60% by 1st April, 1997, 80% by 1st April, 1998 and 100% by 1st April, 1999. Similar provisions would need to be made for which water pricing committee could be set up in case of Tamil Nadu WRCP and Orissa WRCP and their recommendation for cost recovery will be implemented. It is hoped that in course of time all the states would follow suit.

Illustration

For prevailing water rates of Rs. 100 per ha. against the O&M charges of Rs. 270 per ha. the revised water rates in each year during five years i.e. the time period against which the water rate is to be finally revised to fully cover O&M charge will be as under with assuming 8%, 10%, 9%, 11% and 7% of inflation rate in the 1st, 2nd, 3rd, 4th and 5th year of revision period.

$$\begin{aligned}\text{For the first year } (X_1) &= 100 + \frac{(270-100) (1+8/100)}{(6-1)} \\ &= 100 + 36.72 = \text{Rs. } 136.72\end{aligned}$$

$$\begin{aligned}\text{For the second year } (X_2) &= 136.72 + \frac{(270-136.72) (1+10/100)}{(6-2)} \\ &= 136.72 + 36.65 = \text{Rs. } 173.37\end{aligned}$$

$$\begin{aligned}\text{For the third year } (X_3) &= 173.37 + \frac{(270-173.37) (1+9/100)}{(6-3)} \\ &= 173.37 + 35.11 = \text{Rs. } 208.48\end{aligned}$$

$$\begin{aligned}\text{For the fourth year } (X_4) &= 208.48 + \frac{(270-208.48) (1+11/100)}{(6-4)} \\ &= 208.48 + 34.14 = \text{Rs. } 242.62\end{aligned}$$

$$\begin{aligned}\text{For the fifth year } (X_5) &= 242.62 + \frac{(270-242.62) (1+7/100)}{(6-5)} \\ &= 242.62 + 29.30 = \text{Rs. } 271.92\end{aligned}$$

CHAPTER VIII

STRATEGIES FOR IMPLEMENTATION OF THE PLAN BASED ON MALADY-REMEDY ANALYSIS INCLUDING PERSONNEL POLICIES *

8.1 INTRODUCTION

The Development of Irrigation in our Country had been receiving high priority in successive Five Year Plans consuming bulk of the public sector investment to make us self sufficient in food and fibre. To achieve this objective, a number of major and medium projects were taken up in various plans. Upto VIII Plan, as many as 311 Major projects and 954 medium projects were taken up. Out of which 128 major projects and 688 medium projects were completed upto end of 1994-95. Against Country's assessed 113.5 M ha of ultimate irrigation potential, the share of major & medium projects is 58.5 M ha. Out of this, a potential of 31.6 M ha has been created upto AP 93-94 from major and medium projects. An investment of Rs 60,400 Cr on major and medium projects have been made upto 1993-94.

However, for quite some time, it is observed that inspite of best efforts some projects were running behind schedule and there has been continuous shortfall in the achievement of targetted potential and envisaged benefits. This is a matter of serious concern to both planners and the Government. It has, therefore, become necessary to go into the details of the various causes which are delaying the projects and come out with certain solutions and recommend actions so that the future programme of irrigation in the successive Five Year Plans could be expedited.

8.2 CONSTITUTION OF A SUB-GROUP:

To examine the various aspects of Project Implementation Strategies a sub-group was constituted with the following terms of reference:

- i) To recommend appropriate strategies and measures for successful implementation of IX Five Year Plan on the basis of malady-remedy analysis.
- ii) To recommend personal policies to help minimise adverse impact, administrative/managerial constraintts in the implementation of the programme.

The sub-group submits its report for acceptance by the Working Group. The main recommendations of the sub-group on the above TORs are presented in the following paras.

* Report of the Sub-group for TOR viii.

8.3 RECOMMENDATIONS OF SUB-GROUP ON MALADY - REMEDY:

8.3.1 SURVEY & INVESTIGATION OF PROJECTS:

Detailed Surveys and Investigations is one of the root causes for delay in construction of irrigation projects resulting in cost and time over -runs. This is especially so regarding command area surveys. The construction of projects is started by the States but the detailed command area surveys which are essential for fixing canal alignments, minor network planning, command area drainage plan etc are not available at the beginning. Hence, enormous time of construction phase is lost in carrying out such surveys. This kind of lapse not only delays the basic spade work of planning and designing of the canal system including canal structures but also all the pre-construction activities such as plans & estimates, Draft Tender Papers, Technical sanctions, Floating of Tenders, Award of contracts etc. This is, therefore, recognised to be a major constraint in our present approach for implementation of Water Resources Projects.

The recommendations of the sub-group in this regard are:

- a) The major & medium irrigation projects should be taken up by making simultaneous arrangements for carrying out detailed command area surveys at DPR stage alongwith preparation of the project report with the help of additional staff available and/or through consulting firms who are experts in this field. The same Consultancy Agencies should also be entrusted with the work of finalisation of final alignments, cost estimates, designs, preparation of land acquisition schedules, DTPs including general and technical specifications.

In case of larger command areas if survey and investigation & design of disnet is entrusted to more than one agency, then the Govt Officers & Staff at the level of Xens & SEs should invariably cross check the survey and contouring works in particular with adjacent blocks and tally the survey work of different agencies. This is necessary because continuity of canal systems along with their bed slopes is required to be established. This will also bring out any mistake done by one agency if the contours do not tally with adjacent blocks survey by different agencies. The consulting agencies should also be asked to establish additional permanent bench marks within their jurisdiction to enable such cross checking.

The work of surveying should be assisted with the help of ariel photographs on which photogrametic work is done to draw exact contours of the area. The State Government may therefore be advised to procure such ariel photogrametic maps and furnish to the consultants who will utilise these maps for plotting the canal alignments. This will facilitate early completion and more accurate canal network planning and design work.

guided by furnishing standard designs of structures and construction techniques prevalent in the State. For this purpose, State's Design Organisations should come up with mannuals pertaining to minor network design and micro canal structures conforming to relevant RWS system in the particular State etc.

- b) While doing the above, the project authorities also be assigned the task of "Irrigation Intention Survey Work" which may include contacting the individual or group of farmers to intimate the Government's intention for providing water for irrigattion through this project by constructing the canal distribution system.
- c) The Government staff and the consultants may formulate Water Users Association(WUA) minor-wise and sub-minorwise to facilitate smooth functioning of RWS system with the assistance of NGOs. In this case, the policies and issues should be evolved and solved by the project authorities.
- d) In case of standardised design of various types of canal structures on canal system network in minors, sub-minors, water courses and field channels, the project authorities shall assist the construction agencies in organising and establishing pre-cast factory for preparing quality canal structures. This will facilitate to avoid lot of inconvenience caused in construction of small canal structures and maintaining the geometry and quality of the structures. This procedure will reduce the construction time and may also result in saving in cost.

8.3.2 CONSTRUCTION PROGRAMME & PLANNING:

Dams are often completed much in advance of the canal system thereby locking up the huge investments without yielding benefits. This is more conspicuous with regard to the distribution system. Dam and the main canals, being concentrated and expenditure-oriented works are given more attention. On the

other hand, the distribution system works being of scattered nature, less expenditure-oriented & cumbersome involving lot of spade work but none the less most important component for achieving potential are given less attention. It is also seen that agencies are fixed to execute works all over on the main/branch canals and on the distribution system in a haphazard manner with the result that not even a single distribution system block gets completed fully which can be put to use for irrigation.

The recommendations of the sub-group are:

- a) The construction programme of the major and medium projects should be prepared by the project authorities in such a way that it ensures simultaneous completion of both dam, canal and the distribution system.
- b) Such a construction programme, envisaging simultaneous completion of dam & canal system should be drawn up both in physical & financial terms and form a part of the Detailed Project Report submitted for TAC/Planning Commission clearance.
- c) In order to bind the project authorities to adhere to the approved construction programme for achieving simultaneous completion of Dam and Canal/Distribution System. The Secretary of Water Resources Dept will allocate project-wise budget and will also advise the concerned project authorities to reallocate the project fund separately for Dam, main canal and distribution system to achieve the target.
- d) The ongoing projects where this anomaly has occurred already, the same could be corrected to a reasonable extent by giving higher priority in funding in IX Plan to such projects, so that the lagging distribution systems could be completed early and returns start flowing.
- e) In case of large projects having CCA more than 50,000 ha, a sub-project/phased approach need to be adopted. This means that the project would be divided into a number of sub-projects/phases for implementation within one plan period ie., 5 years so that even partial completion of the project could be achieved in all respects and returns start flowing. Secondly, even if additional outlays, per chance, are not made available to continue work on other sub-projects the investment made will not remain unproductive.

- f) In case of other major and medium projects ie., having CCA less than 50,000 ha, the execution of main canals and distribution system could proceed block-by-block from head to tail basically with the same objective as of a sub-project/phased approach in which a sub-project will be replaced by a distribution system block.
- g) While fixing the agency for construction of canal disnet, the size of the block should be so selected that it could be catering say one Village Service Area(VSA) or multiple of that and the works included in the tender should contain all items from the main canal onwards upto minor, sub-minors catering up to sub-chaks of 5-8 ha so as to enable starting of irrigation management on release of waters from the main canal. This will also avoid complications of overlapping agencies in one command area block and minimise contractual problems.
- h) Wherever feasible, the construction of the dam may be so planned that it is possible to start using partial storage either by lifting or by flow irrigation as the case may be.

8.3.3 LAND ACQUISITION:

Many projects are delayed due to land acquisition problem in submergence, the canal system as well as in the R&R programme. Various reasons identified for delays in land acquisition are: lengthy and time consuming revenue procedures as per the Land Acquisition Act, involvement of another department ie., Revenue Department for whom the priority for irrigation need not be their priority, staffing constraints in the Revenue Department for deployment of sufficient Land Acquisition Officers, clear entitlement in the revenue records, poor coordination between Irrigation and the Revenue Departments etc.

The land acquisition problem affects canal system works the most. Often the contracts are awarded by the Irrigation Departments pending full finalisation of the land acquisition awards presuming them to be forthcoming in the process of execution but it does not happen so, resulting in many channels completing on the downstream side with upstream portion held up for want of LAQ or creating gaps in between not permitting water to flow. This phenomenon is being experienced practically in all the projects across the country thereby delaying their operation to generate timely returns and as well escalating the project costs.

Although this aspect is not directly under the control of the Irrigation Departments, the following measures could be adopted to minimise the problem:-

- a) Land needing acquisition should be identified well in advance with respect to owners, survey no, exact measurements etc for completing modalities for early acquisition as per LAQ Act of the State. All efforts should be made to physically acquire the land to the extent of 100% before starting the construction.
- b) It is observed that different States have different norms for acquiring lands for canals of different sizes. The LAQ norms are varying much from State to State. It is recommended that some standard norms be prepared and issued to all the States to follow them as far as possible. This exercise should aim at reduction of the land width to be acquired to the minimum extent possible to satisfy the minimum requirements of providing canal service roads, drainage, borrow pits, accommodating spoil banks etc. The land width can vary even in the same canal design for different reaches with different topography and other requirements. The norms may also include recommendations on systematic excavation of borrow areas and dumping of extra earth.
- c) i) In order to overcome the inherent delays arising due to certain provisions of the LAQ Act, the States could review the act and recommend appropriate amendments to the Government of India as may be necessary. This is more pertinent in case of States which have difficulties in sparing land in view of high population density.
- c) ii) Till such time the LAQ Act is reviewed and amended, a new procedure to authorise a separate committee, which could be constituted under Water Resources Departments in each State, be adopted to process the land acquisition cases by fixing the land rates based on consent awards and market rates.
- c) iii) It is further suggested that while awarding contracts for execution of the canal system, a clause may be added authorising the contractors to do all the formalities of land acquisition and obtain the required land to execute the works. Alternatively, the system of consent award may be made a routine procedure to expedite the land acquisition work for dam and canals.
- c) iv) It is observed that many a time, the farmers go to court for land acquisition cases which delay the construction of the canal system. Now-a-days, Lok Adalats are becoming popular in several States. The project authorities are therefore advised to tackle such legal problems by referring the same to Lok Adalats or Special Lok Adalats constituted for the purpose.

- d) Revenue Department need to depute adequate 'Special Land Acquisition' Officers for irrigation projects at least two for each major and one for each medium project or alternatively the irrigation departments may create a separate cadre of LAQ Officers within their department so that they are accountable to the irrigation department which will accelerate the LAQ work.

8.3.4 REHABILITATION & RESETTLEMENT PROGRAMME:

R&R plans are not implemented timely which delays the completion programme of dams and the creation of storages. R&R activity in construction is crucial but not given due attention. The requisite R&R plans are not prepared by the project authorities at the appropriate time. Sometimes even surveys to quantify the exact number of Project Affected People (PAPs) are not ready even till construction of dam have appreciably proceeded.

Many States do not have any R&R policy. As a result of which, R&R provisions vary from project to project within a State. Even if some States have an R&R policy, the R&R plans are not being prepared conforming to the approved policy. All these create resentment amongst PAPs who then tend to stall the project execution by way of making agitations or litigations etc. Their resentment could be due to many factors such as; inadequate compensation, inadequate civic amenities, inadequate programmes for economic development, choice of resettlement sites, enblock shifting in social groups etc.

In order to streamline the implementation of R&R components in projects, this sub-group has to make the following recommendations:

- a) Every State need to have a consistent R&R policy which could be prepared in association with NGOs and adopted uniformly for all the major and medium projects in the State, pending a National R&R policy.
- b) Project R&R Plans need to be prepared and finalised with the involvement of PAPs and NGOs so that the same can be implemented smoothly, efficiently and speedily.
- c) R&R Plans need to be prepared and got approved from the Ministry of Welfare, GOI at the DPR stage and incorporated in the project report to avoid cost escalation. For this purpose, advance action should be taken by the State Governments so as not to delay the project formulation.

- d) Project Construction Programme must include the implementation programme of approved R&R plan to ensure its completion pari-passu with the dam.
- e) It is experienced in some major projects that while planning the canals some farmers lose all or major chunk of their land holdings. They need to be compensated with equal amount of land or the minimum amount of land that may be decided by the Government policy by treating them as PAPs. It is further experienced that while compensating land for land to the PAPs in submergence area and under canal width, some States are finding difficulties in sparing such lands for compensation from forest area, waste land, grazing land and other fallow lands. To meet with such a situation, a Committee of NGOs and Government Officers may be constituted which is authorised to buy private lands by negotiations to handover the same to the PAPs.

8.3.5 OPERATIONAL PLANS FOR CANAL SYSTEM:

The delay in completion of projects sometimes takes place for not having planned and designed canal system with predetermined operational methodology to be adopted for operation of the system. Such operational plans are prepared and finalised at a very late stage almost towards the project completion or microstructures etc to make the system conducive to the adopted rotational water supply system viz Warabandi, Shejpali, Osrabandi etc would not only amount to delays but also additional investment.

The sub-group recommends that:

- a) Any project put up for techno-economic clearance by the States should be designed incorporating a pre-conceived canal operational module to ensure efficient, equitable and reliable water supply to all the farmers especially the tail enders. It is also necessary that the operational plan be prepared and finalised with the involvement of farmers who are the actual beneficiaries of the project.
- b) It is suggested that while preparing the project reports, broad operational plan should be prepared and incorporated in the project report for the whole command area. Then, before the actual operation of the canal system, a detailed operation plan should be prepared well in advance and put into action.
- c) The planning of the canal system network has become a very difficult job particularly because of the small size holdings in the command area. In the past,

attempts have been made in some States for consolidation of land holdings. The experience on this was not a happy one. However, the sub-group desires to recommend to all the States that attempts may be made and continued to consolidate lands into larger fields so as to make smoother operational plan for getting larger benefits. The consolidation may be made easy by clarifying that the ownership of original holders will continue in same proportion to take advantage of smoother irrigation facility which may prove economical and profitable also.

8.3.6 CHANGE IN SCOPE OF THE PROJECTS:

It is reckoned that a major project should be completed in 10-15 years time and a medium project in 5 years. But, against this, it is seen that the projects linger on for a period much beyond the above stipulated norms. Out of ongoing 158 major projects during VIII Plan, there were as many as 103 projects taken up upto V Plan(1974-78) which were still ongoing from 20-40 years.

	I 1951-56	II 56-61	III 61-66	AP 66-69	IV 69-74	V 74-78
No of ongoing projects in VIII Plan	4	8	16	3	17	55

Many of these projects have been delayed on account of change in scope due to various reasons. It is observed that the scopes of the projects are changed to get more benefits and/or to increase safety of the dams and to include or exclude some command areas due to detailed soil survey work. There are other reasons also which could be beyond the control of the project authorities and the scope of the projects had to be changed.

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The sub-group recommends that:

While some changes in the projects, either in the dam design, dam construction, foundation problems or in the canal system are genuine and necessary, the project authorities should take timely action to get the project reports recast by making changes in the designs etc, get the approval in time from the competent authorities and execute the same so as to complete them according to the revised construction programme.

8.3.7 ERM PROJECT WITHIN A LARGE PROJECT:

Sometimes the project completion is delayed because the project authorities have created an ERM(Extension, Renovation and Modernisation) Project within a Project with the result the project continues to linger on indefinitely. This happens generally in a large project which takes more longer time for construction. It is experienced that the work done in the initial years need repairs or renovation or modernisation. It is further observed that the project authorities debit such expenditure of such items in the original project account and show that the original project is continuing.

The sub-group feels that:

- a) Instead of showing the project as continuing project and give the impression as if the project is lingering on, the project authorities might as well prepare a sub-project or a different project for such renovation works and call it a new ERM project for inclusion in the irrigation programme for the following Annual Plan.

8.3.8 LINING OF CANAL SYSTEM:

Many projects have resorted to full lining of the canal system upto 5-8 ha block outlets. In some cases, full lining is being provided to fulfil certain requirements of agreement with an external agency which results in increase in the project cost and its gestation period substantially.

The sub-group is of the opinion that:

- a) Provision for canal lining in full length may not be necessary in all projects. It is suggested that canal lining may be done only where it is necessary after studying the soil properties. That means, lining may be done on selective basis. However, in case of main canal, branch canals and major distributaries where the flow cannot be stopped, lining could be resorted to take all the advantages. Further, it is recommended that in case of water courses and field channels, normally lining cannot be recommended, however, plastic sheet lining could be considered on economic basis.

8.3.9 PROJECT CONTROL BOARDS:

As already mentioned that completion of irrigation projects has been taking much longer period than the envisaged normal period of 10-15 years for major projects and 5 years for medium projects. One of the reasons for this being the

coordination problem for certain interdisciplinary project items involving Finance Department, Forest Department, Revenue Department, Electricity Boards, Agricultural Department etc.

The sub-group recommends that:

- a) In order to ensure economical, efficient and speedy implementation of all major projects, Project Control Boards/Authority with all the statutory powers for sanction of estimates, award of tenders etc should be setup. For mega projects, setting up of independent Corporations or Nigams even could be considered.

8.3.10 FOREST LAND & ENVIRONEMENT PRESERVATION:

As per Forest Land Act, 1980, every major and medium project has to obtain clearance of Government of India, Ministry of Forest & Environment before the forest land could be released in favour of the irrigation department to go ahead with the work. The procedure involved is too lengthy and cumbersome, consuming lot of time. The proposals prepared by the Project Authorities are to be routed through District Forest Officer, Chief Forest Conservator, State Forest Ministry and then GOI's Forest Ministry.

The sub-group recommends the following:

- a) The forest land acquisition procedures need to be streamlined in consultation with the Forest Ministry so that the delays could be minimised.
- b) As per the Forest and Environment Dept, forest land cannot be released unless certain equivalent lands for afforestation are made available. But some States have limited land resource. Such States should be allowed to execute Water Resource Projects on monetary compensation basis against the present mandatory Compensatory Afforestation Programme.
- c) The forest land proposals need to be prepared at DPR stage and clearance obtained for the entire forest land involved in a project in one lump before the start of construction.
- d) It is further recommended that States may be authorised to utilise forest land upto say 50 ha for each development project subject to the condition that the States will compensate the loss of forest as per the Forest Act, 1980. It is also recommended that in case of the development project, requiring more than 50 ha of forest land, the forest departments of the States may be advised to process such cases on priority basis so that the irrigation projects are not delayed on this account.

8.3.11 CATCHMENT AREA TREATMENT FOR ENVIRONMENTAL PRESERVATION:

While clearing the projects by the Forest and Environment Ministry, one of the conditions put forth is that the States have to carry out catchment area treatment for controlling erosion of soils increasing the sedimentation in the reservoirs and controlling floods and flood peaks. Normally, the State Governments are not making any provision in irrigation projects for catchment area treatment in the upstream of the proposed dams.

The sub-group observes that:

- a) Treatment of the catchment area upstream of dams (large dams or small dams) and its requirement is not necessary technically as regular observations of sediment rates are made by the department and necessary provision in the reservoir storage of sediment inflows is made for deciding the life of the project and capacity of the spillways are also fixed to take care of the anticipated flood peaks and flood volumes. Also the catchment area treatment includes several items of work like construction of gully plugs, check dams, land terracing, forest growth etc. The sub-group feels that all these items are coming under the purview of other respective departments and therefore, separate budget allocations are also made by the State Government in those departments for such works.

In case of inter-state projects or international projects, the execution of CAT works becomes more complex and difficult. The project authorities have to take up this issues at higher popular government levels.

8.3.12 FINANCIAL POWERS:

In many States the limit of financial powers delegated to various categories of officers for sanction of estimates, award of contracts, sanction of extra items/substitute items etc have become obsolete due to escalation in prices of material and labour. As a result of this, the estimates/tenders have to be submitted to higher authorities or even Government for obtaining sanctions which takes lot of time and delays in the execution.

It is suggested that:

- a) Delegation of powers for various categories of engineers may be reviewed by the States and increased suitably keeping in view the requirement of works involved in irrigation projects.

8.3.13 CONTRACTUAL PROBLEMS:

The progress in many projects suffer on account of contractual problems arising out of various reasons. Contractors abandoning the work, another contractor fixed on risk & cost basis also abandons, disputes for rates of extra items & substituted items, price escalation, slow progress by contractors due to financial crunch, contractual clauses leading to too many arbitrations etc are some of the examples of contractual problems. Unless they are minimised the progress would continue to get set back.

The recommendations of the sub-group for this are:

- a) Contract Committees for settlement of disputes arising from contracts awarded should be set up in the States.
- b) Provision of contract clauses needs to be reviewed and suitable amendments made to make them workable and reduce the arbitrations. There is rather need for evolving standard contract documents for important major works of river valley projects at the National Level which should be followed by all the States in a unified manner for execution of Water Resources Projects. This work could be entrusted to Bureau of Indian Standards.
- c) The system of fixing of another agency at risk & cost of the previous agency has not been found to be working effectively. It is considered better to rescind/ annul the original contract after observing all formalities and refix a new agency.
- d) The main work of the project could be split up into 2 to 3 slices only as far as possible. The idea is that the work of the project should be executed with minimum number of contract agencies and splitting up of the work into many small slices should be discouraged.
- e) States may also review the system of tendering of works to minimise the contractual problems. Switching over to ICB or LCB system of tendering may not be workable in every situation. Sometimes, piece work system may require to be adopted as it provides greater flexibility.

8.3.14 WATER COURSES AND FIELD CHANNELS:

As per the present norms, the last Government outlet is to be provided at 5-8 ha sub chaks, with water courses forming part of the project estimate. In some States, it is seen that even the construction of field channels is carried out at the cost of the projects. Earlier, the projects were being

constructed with Government liability only upto chak outlets serving 40 ha (100Ac) or even more depending upon the design water allowance. Gradually, with the passage of time, more and more responsibility was shifted on to the Government with inclusion of water courses and field channels etc thereby increasing the project's cost and implementation period substantially. The component of land acquisition for water courses etc also increases consuming additional time.

The group feels that:

- a) In view of the present state of affairs when project costs and time overruns are mounting up, it may be worth considering to review and redefine the project limits for it to be upto 40 ha chak outlets and leaving the water courses/field channels activities to be undertaken independently under the CAD programme.

8.3.15 BUDGET PROVISION & ITS RELEASE:

During the Annual Plan discussions in the Planning Commission, the project-wise outlays are recommended/ approved based on critical review of their Progress and Programme. But, while making budget provisions at the State level, they are often changed. Even the earmarked outlays for important projects as recommended by the Planning Commission are not adhered to.

It is also experienced that the release of budget by the State Governments to the project authorities is erratic and piece meal which affects the construction planning and progress of ongoing contracts. Sometimes a good chunk of budget is placed at the disposal of the Project Authorities at the fag end of the year, which they are unable to spend in the absence of requisite advance planning.

The recommendations of the sub-group in this context are:

- a) The budget provision on projects needs to be made as per outlays approved by the Planning Commission.
- b) Full budget may be placed at the disposal of the Project Authorities right in the beginning of the year so that the construction activities, tendering etc could be planned accordingly.
- c) If full budget cannot be released on one go, atleast the indication of firm yearly budget may be given to the project authorities in the beginning and LOC released on regular intervals atleast quarterly on the basis of firm yearly budget.

8.3.16 NEED FOR TAKING UP NEW MAJOR & MEDIUM IRRIGATION PROJECTS:

Though India has created irrigation potential of 81 million ha, the utilisation is about 73 million ha and this has attracted much criticism from various quarters. The aspect of under utilisation of potential has been studied by various authorities and some of the main reasons identified are over-reporting, non-completion of last distribution network system which include construction of water courses, field channels, land levelling and drainage etc. These last items of works which remain pending are all of small sizes and scattered nature and cannot be completed without the cooperation of the farmers. Thus, this work is time consuming though the cost component involved is very small.

Suppose, the time required to complete the last items of disnet works to fully utilise the created potential of 81 Mha is say 8 to 10 years. During this period the population of the country would have increased from 94 crore crore at present to about 120 crore, considering population increase @ 2% annually. The present consumption rate of food is roughly estimated at 2 MT per year per crore of population. We have produced about 188 MT of food during 1994-95, catering to the needs of 94 cr population. Thus, at the rate of 2MT per year per crore of population, the requirement of food grain may touch a level of 240 MT by 2005 AD. Thus, the planners will have to think of increasing the food production adequately to match with the increase in population. While increase in the utilisation of created potential is likely to be slow and take long time, the need for food production would increase at a faster rate than the increase in the utilised potential.

The sub-group feels that:

- a) It will be necessary to create simultaneously additional irrigation potential by taking up new major and medium irrigation projects. The cause of under utilisation of created irrigation potential should not come in the way of taking up new major and medium irrigation projects. To substantiate, we can take example of any project in the country say industrial project, navigation project, hydro-electric project etc. These projects may have been constructed with firm maximum turn over or firm manufacturing capacity, but the day on which they are completed they do not start producing at the maximum capacity for which they are designed. Therefore, the project may be any type it needs time to achieve its full production or full utilisation which can take place only in a phased manner.

**8.3.17 THOROUGH INVESTIGATION WORKS AT
NEW PROJECT SITES:**

In the past during construction of major and medium projects in the country, we came across several surprises when the foundations were actually opened out either for earth dams or for masonry/concrete dams. On several projects, geological features of grave nature had come across like existence of shear zones, faults, folds, intrusion of weathered dykes in parent rocks, cavernous limestones, red boles, argillaceous sand stone etc. These were noticed during construction and the design of the dams and foundation treatment had to be changed resulting in time overrun and cost overrun.

Similarly due to change in the climatic conditions during last 50 years or so, the frequency of high floods with higher intensity of rainfalls are experienced during construction of these projects. Therefore, the design floods had to be reviewed and spillway capacities had to be changed.

In several states, regular investigation units do not exist and therefore hydrological data and foundation data are not investigated thoroughly in advance. Many times the construction materials have also changed in quantities and qualities necessitating change in the design of the dams.

The geological investigations for foundations of the dams, for foundations of major canal structures and rubble quarries, sand and gravel/shingle quarries also had not been done adequately resulting in changes later on.

The sub-group feels that:

- a) When new major and medium irrigation projects are taken up in future, all the states may be advised to create water resources investigation divisions and circles alongwith required testing laboratories and drilling machines etc to carry out thorough investigation of the projects.
- b) The sub-group has observed that due to inadequate investigations carried out in past, several projects today are showing distress by way of heavy seepage, development of cracks, deterioration of structures, rusting of gates, piping through foundations, choking up of drains etc. The sub-group therefore, feels that all the states in the country be also advised to establish Dam Safety Organisations with experienced personnel to study such distress and take immediate measures to bring the structures to the safe stage.

8.3.18 TANKING UP NEW MAJOR & MEDIUM PROJECTS IN IX PLAN:

One of the strategies in VII and VIII Plans was that no new projects should be undertaken unless the ongoing projects have been completed. A stage has come in some states that the ongoing projects are mostly completed and there being no new project, lot of experienced staff on design and construction has been rendered idle. When such staff is posted on other assignments like CAD or O&M of projects, it is observed that they cannot successfully handle these assignments. Therefore, if the same approach is maintained in IX Plan as well, this may amount to inadequate utilisation of the expert engineers and staff. In some other states, certain Tribunal Awards have been finalised and their recommendations are to be implemented in a time bound manner. This will necessitate taking up of new projects in such States. In some other States, scarcity and famine conditions are occurring frequently once in 3 to 4 years. In such States, it is necessary to tap all the available water resources by constructing new projects. In some other states, the development of irrigation potential is much less than even the national average, these States will have to take up new projects to increase and tap the balance potential as early as possible by taking up new projects.

This sub-group recommends that:

- a) When the new projects are taken up by various states under the circumstances narrated above, these States should rely on the additional funds as will be recommended by the other sub-group for TOR No(x) which would suggest the procedure for ensuring allocation of adequate resources for the water resources sector.

8.3.19 PERSPECTIVE PLANS FOR NEW PROJECTS:

All the States have been requested to furnish details of all the ongoing projects in their States. These details will include the present position of the projects including estimates for remaining work on these projects alongwith additional irrigation potential that will be created through these projects. The sub-group has recommended that most of the States will have to take up new projects under various circumstances. This will, however, depend on the back log of ongoing projects and the compulsions on account of circumstances in the States.

The sub-group, therefore, recommends that:

- a) All the States shall be requested to prepare perspective planning for longer periods say 10 years, 15 years or even 20 years. Such data and details will prove very useful guidelines for preparing future Five Year Plans.

**8.3.20 O&M FUNDS DURING CONSTRUCTION FOR
PARTLY COMPLETED WORKS:**

It is seen that major and medium irrigation projects have been taking exceptionally long time for their completion. In the mean time, the head works and part canal system are completed and also irrigation commenced with the partly constructed system along with construction of other portions of the project. It is observed that the maintenance of part portion of the project which has been made operational suffers on account of the non availability of maintenance funds. The State Governments have prescribed norms that O&M funds would be made available to a project only when the project is fully completed. As a result of this, the project authorities find it very difficult to keep up the completed system in a good condition. Therefore, when the plan funds are made available to the projects annually for carrying out the construction activity, they are diverted for the maintenance of the completed works. Though the funds for maintenance works are very much required, this practice is making the construction activity suffer and thereby delaying the project completion.

The sub-group recommends that:

- a) Separate plan funds for maintenance work during the construction phase of the project need to be provided and made available to the project authorities to avoid deterioration of the completed works.

8.3.21 IRRIGATION WATER RATES:

Irrigation water charges today are the highest in Gujarat and Maharashtra in the country. These rates are fixed on specific season-ha basis. These rates are very low when compared with the economic rates. They are hardly covering 5 to 10% of the actual expenditure done on operation & maintenance of irrigation. The practice of giving water for irrigation is by flooding the fields. It is desirable that the States should agree to give water on volumetric basis and also charge accordingly. Till this is done, the States are giving water to the farmers by flooding system and at highly subsidised rates and making losses to the State's exchequer.

The sub-group recommends that:

- a) The water charges should be regularly reviewed for every crop once in a period of 2 years and this should be revised accordingly. In fact, many States have a regular rule of reviewing the water charges every 2 years, but, they are not able to review nor raise the rates on account of popular reasons or natural calamities like drought, famine, floods etc.

The sub-group, therefore, further recommends that instead of reviewing the rates every 2 years, the States may decide once for all, the automatic increasing in the rates every year by 5% or every 2 years by 10% irrespective of regular reviews by the departments.

8.3.22 TRAINING OF SPECIALISED ENGINEERS & TECHNOCRATS:

In almost all the States, Water Resources Departments have 2 wings i) Project Wing and ii) CADA Wing. The project wing has Engineers, Technocrats and Scientists who have become specialists in construction of dams and canals, research work applied to river valley projects, designs of dams and canals, quality control, monitoring construction activities, environmental protection works etc. The other wing namely CADA wing has highly trained engineers, technocrats, scientists and agronomists who are specialised in irrigation management works.

From VII Plan onwards, the Planning Commission is deciding not to take up new major & medium irrigation projects. Therefore, it is observed that in almost all the States, engineers, scientists, research workers and design staff are not fully utilised for CADA works as there are sufficient trained staff available in CADA wing and very little additional work is involved in the CADA wing to complete the remaining canal system work including distribution net work system upto farmers' fields.

The sub-group observes that:

- a) the above problem can be analysed for 2 conditions namely i) if new major and medium irrigation projects are to be taken up in IX plan and ii) if no new major and medium irrigation projects are to be taken up in IX Plan. In case of the first condition, expertise available in the dam and canal building activities would be utilised and it would be possible to increase the irrigated command area according to the need of the country. In case of the second condition above, the sub-group recommends that certain part of the expert staff should be retained to look after the maintenance and health of the dams and canals and other part of the expert staff be trained for the subject of CADA and slowly transferred to CADA wing to carry out the regular as well as increased work in that wing.

8.3.23 THE NEW IRRIGATION PROJECTS IN DROUGHT PRONE AREAS:

It is observed that by the sub-group that in drought prone areas where either 3 out of 4 years are having less than normal rainfall or where one out of 4 years is very good year, the farmers make their own arrangements for their survival by digging wells, tube wells or by construction of check dams etc. Under such circumstances when new irrigation projects are taken up, farmers show reluctance to take water from canals and continue with the old procedure of pumping water from their wells, tube-wells etc. Presently, almost all States in the country have revised electricity charges for particular size of pumps and the rates are fixed so low that the farmers are deciding to continue pumping waters from wells/tube wells and not utilising the canal waters. The second reason for such attitude of farmers is that their wells/tube wells get recharged from the new dam and thus they get extra water easily without payment of any additional charge towards the capital cost of the dam.

The sub-group feels that:

- a) Farmers could be attracted to use canal waters by creating suitable incentives.

8.3.24 CREATION OF ARTIFICIAL SCARCITY OF WATER:

In our country, generally, method of irrigation adopted on all the irrigation projects is flood irrigation. Recently, attempt is made, though on a very small scale, to adopt Sprinkler irrigation and Drip irrigation. This is however, a negligible effort. The farmers and the government staff have still not developed cordial relations so as to give timely waters to the crops resulting in low production. During the recent scarcity years, some states experimented to create artificial scarcity of waters by releasing less quantity of water for the same command area. It is observed that under such circumstances the farmers have united and have cooperated in the experiment and grew their crops with less water (though the water was optimum for growth of the crops).

The sub-group therefore recommends that:

- a) To improve upon the present practice of flooding the fields, similar experiments be carried out in all the states so that the farmers could be trained to use optimum waters needed by different crops. Incidentally, this will also minimise the problem of increase in water logging and salinity in the command areas. It is also studied that by such practice of creating artificial shortage, the production rate has also increased per ha.

8.3.25 PAYMENT OF ROYALTY AND SALES TAX BY CONTRACTORS:

During the construction of major and medium irrigation projects, the contractors have to collect rubble, quarry spalls, sand, gravel/shingles, earth etc from the nearby quarries and river beds. The Geology and Mining Departments in the States charge royalty on collection of such materials. It is observed and experienced that there is always dispute between the contractors and Geology and Mining Department on the points of rates and quantities. Some times the quarrel is also on the location of quarries. This delays construction of the projects.

The sub-group feels that:

- a) Water Resources Department and the Panchayat Departments should directly pay royalty to the Geology and Mining Department and take the responsibility of fulfilling this requirement so that the delay is minimised.

8.3.26 SURVEY IN FOREST AREAS:

Whenever an irrigation project is taken up for construction, land survey work is required to be done in the submergence area as well as in the command area. There always exists some forest patches and reserved forest patches (without trees). The question of taking prior permission of the forest department is always overlooked by the Water Resources/Irrigation Department in the States and the delay occurs due to non-permission for survey in the forest area by the forest department.

The sub-group recommends that:

- a) Water Resources/Irrigation Department in the States should take timely action to obtain the necessary permission from the forest department for carrying out the requisite surveys for the projects taken up for construction.

8.3.27 INCENTIVE TO CONTRACTORS:

It is seen that some States provide as one of the clause in the contract agreements for giving incentives to the contractors when they complete the work before time.

The sub-group feels that:

- a) If all the States are advised to provide similar clause of giving incentives to contractors in case they complete the work before time, this may provide a good encouragement to the contractors and prove effective in minimising the delays.

It is also further recommended that such incentives could be in the form of some percentage of the tendered rate or/and merit certificate.

8.3.28 WATER LOGGING PROBLEMS IN IRRIGATION PROJECTS:

It is observed that in many major and medium irrigation projects water logging has taken place in small patches or in large patches in the command areas. This has happened due to more than one reason. One is that irrigation in India at large is being done by flooding system and without exact calculations of water requirements of different crops. Second reason is that the farmers for long time did not get confidence and faith in governmental agencies that they would be getting water in time according to the rotational schedules fixed for the projects. The third reason is that construction of surface or underground drainage system is not carried out simultaneously during execution of the canal system in many projects. Even vertical drainage of the rising ground water table is not taken care of by using ground water from open wells or tube wells. The fourth reason is that the soil types and number of waterings. In most of the projects, the soil types are not taken into account to fix delta and number of waterings according to the soils met with.

The sub-group recommends that:

- a) Directives could be issued to all the States to study the problem of water logging project-wise and take immediate steps to construct drainage system either surface or sub-surface and construct wells and deep tube wells to minimise the water logging areas and improve these areas to make them suitable for cultivation.

The sub-group came across two examples in the country. In one State, deep tube wells are constructed in the command area by selecting higher patches of lands which were not covered by flow irrigation being higher than full supply level of the canals. The State has constructed tube wells on these high patches of lands and have increased the command area within the original gross command area and lowered the ground water table in the whole command area with great improvement on water logging.

In another State, the State Government could not locate higher patches of ground within the gross command area. So, they constructed deep tube wells within the command area and dropped the tube well waters in the running canal thus mixing surface water and ground water. This method gave two advantages. One is that ground water table started lowering thereby improving the water logging areas and the second is that due to availability of extra water from the ground the command area was increased by expanding canal system. The problem however cropped up regarding fixing water rates as the water flowing in the canal is a mixture of surface water from dam and ground water from tube wells. The Government could think of a smooth solution to this problem.

8.3.29 TIMELY SUPPLY OF IRRIGATION WATER TO THE FARMERS:

In almost all the major irrigation projects having large command area and in some medium irrigation projects having longish command area, it is found that water is not being given to the farmers in time thereby affecting the crop production. On some projects in some States, Canal Telephone Systems have been installed but they are not found to be quite efficient everywhere. Installation of wireless system could be another alternative and even use of Walki-Talki is recommended. In one of the projects in the country which is under construction canal

automation is to be tried for supply of water to farmers in time.

The sub-group recommends that:

- a) All these latest communication devices be installed on existing and new irrigation projects to achieve better results on crop production.

3.8.30 SWITCH OVER TO VOLUMETRIC SUPPLY OF WATER FOR IRRIGATION:

At present the practice of giving irrigation water in almost all the projects in the country is by flooding system. Some efforts have been initiated in some projects in some pockets of command areas to install drip and sprinkler irrigation system but the progress is insignificant as compared to the large irrigated area of about 80 million ha in the country. It is now time to convince the farmers and agriculturists to take water on volumetric basis which will enable the State Governments to keep account of use of water and if and when this is done the water charges may be converted from the ha-season basis to cubic meter basis.

The sub-group observes that:

- a) By switching over the irrigation system to volumetric system there will be economy in the use of water and the benefit of such economic use of water could be spread to larger areas in the command either by increasing intensity of irrigation or by adopting extensive irrigation.
- b) The sub-group further observes that efforts are being made on many projects in the country to introduce Rotational Water Supply(RWS) System. The introduction of RWS will give the advantage of distribution of water in an equitable manner. However, if the system of irrigation by flooding is continued, the advantage of RWS will be limited.

8.3.31 THEFT OF IRRIGATION WATER OR ILLEGAL USE OF IRRIGATION WATER FROM CANALS:

It is experienced and heard from many irrigation projects in various states in the country that some farmers take water from the canal system out of turn and in larger quantities or some farmers take water illegally in the field which are not sanctioned for supply of irrigation water. Such theft of water is done by putting pumps on the canal banks or by breaching the canals.

The sub-group feels that:

- a) In such cases strict watch and ward arrangements should be made for the security of the project for taking full advantage from the projects. The sub-group further recommends that measuring devices like V-Notches, Standing Wave Flumes, Parshall Flumes etc with the help of automatic gauge recorders should be installed on liberal scale which means that such measuring devices be installed on main canal, branch canals, distributaries, minors, sub-minors and even on field channels. Introduction of such a practice of measuring canal waters at various locations may help to pin point the locations and the defaulting farmers could be dealt with accordingly. The State Governments may also consider to make theft of water a cognizable offence.

8.3.32 INTRODUCTION OF DRIP IRRIGATION AND SPRINKLER ON LARGER SCALE:

Today Government of India and many State Governments are very eager to switchover the conventional irrigation systems to drip irrigation and sprinkler irrigation systems. The Government of India and many State Governments are encouraging farmers to purchase drip irrigation and sprinkler irrigation equipments by giving heavy subsidies (upto 50%). It is observed that even this subsidy is not found to be adequate to spread the funds to the larger community of farmers as small and marginal farmers still find difficulty in sparing the remaining amount to buy such costly equipments.

The sub-group feels that:

- a) This movement is good and efforts in right direction and if possible the subsidy could be raised to 75% or even 100% in selected projects to start with. The projects and the regions could be selected on priority basis according to the conditions of the regions and the projects.
- b) The sub-group observes that by introduction of drip irrigation and sprinkler irrigation there will be huge saving of water to the extent of 50 to 70% which could be utilised for other purposes like supply of drinking water to the needy villages and towns, supply of water to industries (new or old) and supply of water for irrigation purposes by expanding the command areas.

8.3.33 REAPPRAISAL OR EVALUATION OF PROJECT PERFORMANCE AT REGULAR INTERVALS OF FIVE YEARS:

The sub-group has observed that regular evaluation of project performance is not being done in many of the States, resulting in poorer and poorer performance due to lack or ignorance of the performance data of the project.

The sub-group feels that:

- a) If regular evaluation of the performance of irrigation projects is done, the project authorities and the State Governments would come to know where they stand in performance of the projects ie., whether the projects are performing as per the design made at the time of formulation of the projects. Several parameters have to be studied while evaluating the performance of a project. Some of the parameters are narrated as below:
 - i) **Flood peaks and flood volumes:**

After construction of the projects, the practice of measurement of river flows namely gauge and discharge data should be continued and flood peaks and flood volumes should be studied. This data should be added to the previously adopted inflow series and improvement in the design floods and use of storage should be reviewed.
 - ii) **Replenishment of Reservoir:**

Data on the filling of the reservoirs including spills during monsoon should be observed regularly and accounted for in the previously assumed series for revising the use of reservoir storage.

iii) Designed Culturable Command Area Vs Actual Irrigation Area:

Every project has a designed GCA, CCA and ICA. So, after construction of the project and putting it into operation, the data of actual irrigation vis-a-vis designed CCA should be available alongwith the reasons for shortfalls if any. Such data could be collected annually and also seasonally which could form the basis to review the size of the command area and to make changes if any based on the fresh requirements at that time.

iv) Improvement of original saline area in the command or improvement of class-IV lands in command area:

In some projects, saline lands are included in the command area at the time of design of the project with the assumption that these saline lands would be reclaimed subsequently and put to cultivation. This has to be regularly reviewed and progress has to be watched and monitored.

v) Grass land improvement:

In some projects, grass lands are included in the designed command area assuming that with the improvement in land laws, the grass lands would be converted into cultivation. Progress on such conversion should be monitored and the command area should be revised depending on the progress made on the problem.

vi) Land levelling:

At the time of design of the project, the culturable command area is fixed which include even uneven lands with the provisio that land levelling would be done and the uneven land with high patches would be levelled and brought under cultivation. This has to be watched and monitored.

vii) Irrigation Water Requirement:

In most of the irrigation projects, water supply for irrigation was assumed either on duty basis or on delta basis in the earlier years during the last 15 years. But procedure is changing and actual water requirement based on 'Modified Penmen method' is being adopted. The adoption of Modified Penmen method

necessitate installation of Weather Stations at the project sites and in command areas to monitor the climatic parameters like rainfall, evaporation, temperature, humidity, sunshine time, barometric pressure, wind direction and wind velocity etc. All the States may therefore be advised to adopt scientific methods of calculating the net irrigation requirements and use the irrigation waters accordingly.

viii) Siltation in Reservoirs:

In early 60s and 70s, the irrigation projects were designed with empirical formulae to find deposition of silt and sediment in the reservoirs coming along with the floods. The criteria of sediment deposition in the reservoirs have changed and according to the latest criteria, the siltation in the reservoirs -both quantity and locations should be studied and lives of the reservoirs should be freshly worked out and constantly reviewed to take appropriate measures to get benefits for the designed lives of the projects.

ix) Efficiency of irrigation projects:

Efficiency of the irrigation projects should be worked every year and should be compared with the design efficiency and even the design efficiency assumed at the time of formulation of the projects should be reviewed as the methods of irrigation are changing and lot of modernisation works are taken up in several irrigation projects.

8.3.34 Construction of canal structures on Railway Crossings:

The canal system of any major or medium irrigation project involves construction of a number of canal structures across the existing railway crossings. These structures are designed and executed by the Railway authorities. Therefore, getting this work done through railways takes lot of time as procedure involved is very lengthy and time consuming thereby delaying the projects.

The sub-group recommends that:

- a) In order to minimise delays on this account, the Indian Railway Authorities should be approached to frame guidelines for design and execution of the railway structures in water resources projects to ensure their speedy completion.

8.4.0 RECOMMENDATIONS OF THE SUB-GROUP ON PERSONNEL POLICIES:

8.4.1 FREQUENT TRANSFERS:

Frequent transfers of Project Engineers especially at the level of SEs, XENs, AEs affects the tempo and continuity of construction works. Engineers should, therefore, not be transferred before at least a period of 5 years or during the critical phases of the project even if it amounts to exceeding 5 years.

8.4.2 VACANT POSTS:

The sub-group observes that a number of posts of SEs, XENs and AEs remain vacant for fairly long times thereby causing delays in the decision making process on tenders, sanctioning of plans, estimates etc and consequently slippages in the scheduled targets. For completing a project as per the stipulated time frame, it is necessary for the State Governments to ensure 100% positioning of staff at all times during the execution of projects.

8.4.3 POSTING OF MOTIVATED/DYNAMIC ENGINEERS AT PROJECTS:

Apart from the full strength at the projects, it is also necessary to deploy motivated, dedicated and dynamic engineers rather than only filling up the posts with some one who is not suited for design and construction works. This factor assumes importance in the context that the project activities being inter-dependent, their non-completion as per assigned time frame could affect the overall completion of the project.

8.4.4 HEADQUARTER AT PROJECT SITE:

The headquarter of Senior Officers at the level of CEs/SEs when away from the project area is another major factor for causing delays because immediate decisions as required at site are not available. This is a situation which can be avoided. The sub-group recommends that States may lay down certain guidelines in this regard.

8.4.5 INCENTIVES FOR EARLY PROJECT COMPLETION:

The project engineers and staff posted at the project sites need to be given some incentives for early completion of the projects. The sub-group recommends that the project allowance could be given to all officers and staff members who are posted on the project sites and canal colony sites. Other incentives like Bonus for early completion than the scheduled date need to be considered and announced before hand to generate momentum amongst the staff.

8.4.6 SPECIAL ALLOWANCE:

The engineers posted in Design Organisations may be given 'Design Allowance'. The officers with higher qualification like M.Tech, PhD etc could also be given special pay. In order to attract motivated officers for research work, officers posted in Engineering Research Institutes/WALMI's etc may be given 'Special Allowance'.

8.4.7 CADRE STAGNATION:

The Cadre structures of Engineers is such that there is stagnation almost at each level which causes frustration amongst the engineers. As already adopted by some States, the system of time scale could be introduced by all States so that if not the rank, atleast financial hardship is taken care of.

8.4.8 CHARGE SHEETS/INQUIRIES:

While being at projects, working under all odds, Engineers and staff have to face charge sheets, inquiries etc frequently for even the minor irregularities occurring due to procedural rangles. This discourages the very motivation and dynamism of the officers and staff which brings about slackness in the project work. This aspect needs to be carefully looked into. Departmental Inquiries instituted, if any, needs to be expedited and finalised within some specified period say within 6 months rather than dragging on indefinitely and keeping the officers and staff subdued which affects their work efficiency. In this regard, the sub-group recommends that the project authorities be given some extra powers to deal with the inquiries on their merits.

8.4.9 INCENTIVE FOR INVESTIGATION WORK:

It is often seen that engineers and staff once deputed for survey and investigation work are continued to do so indefinitely facing all hardships. The sub-group recommends that such staff should also be considered for giving project allowance or site allowance. They may also be considered for construction work of the projects in which they were involved at investigation stage.

8.5 REDEFINING THE IRRIGATION PROJECTS:

According to the existing definitions, the Major, Medium and Minor irrigation projects are those which have culturable command area more than 10,000 ha, between 2000 to 10000 ha and less than 2000 ha respectively. Due to multiplicity of implementing agencies of irrigation projects in the States, it is felt that current definitions of various categories of irrigation projects need to be reviewed by 3rd Irrigation Commission.

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CHAPTER-IX

MEASURES FOR IMPROVING THE STATISTICAL DATA BASE, PLANNING, DESIGN AND MONITORING CAPABILITY BOTH AT STATE AND CENTRE FOR IRRIGATION DEVELOPMENT ON SUSTAINABLE BASIS

9.1 Introduction

The primary prerequisite for Water Resources planning, development, monitoring and management is an adequate and reliable data base. The agriculture is an important sector of the economy of the country and water resources management and development would play an increasingly important role to create income distribution facilities for population engaged in agricultural sector. The National Water Policy, 1987 also lays emphasis on improving the quality of data and processing capabilities.

9.2 Sources of Water Resources Data Base

The main sources of irrigation statistics are:

(i) Land Use Statistics (LUS) compiled as part of Agricultural Statistics and published by Directorate of Economics and Statistics, Ministry of Agriculture. Land Use Statistics also gives information regarding irrigated area by different sources of irrigation and as well as cropwise irrigated area.

(ii) Annual Administrative Reports compiled by the State Government Departments.

(iii) Periodical Progress Reports from State Government Departments.

(iv) Adhoc reports prepared by various agencies from time to time on the basis of sample surveys to estimate the minor irrigation works.

(v) Periodical progress reports compiled by the State Governments, Planning Commission and Central Water Commission.

(vi) Census of Minor Irrigation Schemes.

(vii) Agricultural Census

(viii) River Management Wing of Central Water Commission for collection and management of Hydrological data pertaining to river flow, sediment load and water quality.

(ix) India Meteorological Department for rainfall and climatic data.

9.3 Existing System of Generation and Dissemination of Data

(i) Directorate of Economics & Statistics, Min. of Agriculture

The Directorate of Economics & Statistics, Ministry of Agriculture has been compiling and publishing the irrigation statistics as part of Land Use Statistics with a time lag of 3 to 4 years. The data available under it relate to net/gross irrigated area by sources viz. canals, tanks, tubewells etc. and also cropwise irrigated area. These data are compiled for village/tehsil/district and at state level. The primary data for LUS are collected by village patwaris in the prescribed format in certain States and it is estimated on the basis of sample surveys in respect of States like West Bengal, Orissa and Kerala.

(ii) Ministry of Water Resources

The Minor Irrigation Schemes in the States are executed through various agencies. To co-ordinate and compile the information on the statistics of minor irrigation, nodal offices have been designated in individual states. The Director(Statistics), Minor Irrigation Division of the Ministry of Water Resources compiles the information at the national level on the basis of statistics furnished by nodal offices. Similarly the Command Area Development Division of the Ministry compiles and disseminates data on Command Area Development Programmes as collected from State Command Area Development Authorities.

(iii) Central Water Commission - W P & P Wing

(a) Planning & Progress Directorate

Financial progress in terms of investment in irrigation sector and physical progress on achievement of Irrigation Potential Created and its utilisation is compiled by the various departments/agencies of the State Governments. The consolidated figures of potential created/utilised are being supplied to Planning Commission/Central Water Commission by the concerned State Government. Planning & Progress Directorate of Central Water Commission compiles and disseminate information on major and medium irrigation.

(b) Statistics Directorate, Central Water Commission

As per the information furnished by the P&P Directorate and Minor Irrigation Division of Ministry of Water Resources related to major & medium irrigation and minor irrigation respectively and also the data compiled and collected from various sources, this Directorate

maintains statistics of water and related sectors and brings out it in form of annual publication.

(c) River Management Wing

The RM Wing of CWC is engaged in hydrological data collection in all important river systems of the country. As many as 877 hydrological observation sites are maintained all over the country (G= 236, GD=281, GDS=41, GDQ=80, GDSQ=239). Water Year Books, Sediment Year Books and Water Quality Year Books are prepared for each site for dissemination of data.

(iv) India Meteorological Department

The country is divided into 35 meteorological sub-divisions and seasonwise rainfall and other climatic data is collected and analysed by them. The data is transmitted to the National Data Centre at Pune. Meteorological Centres are also maintained at the State Capitals in order to have close co-ordination with State authorities and other User Organisations.

(v) Central Ground Water Board

The Central Ground Water Board is responsible for generation and dissemination of Statistics on ground water.

9.4 Deficiencies of present set up and measures to improve

There is a large variation in the data on irrigation potential utilised provided by the Irrigation Department and gross irrigated area published by the Ministry of Agriculture. A number of Committees/Working Groups have been constituted in the past to deliberate upon the issues involved. The latest was working group on "Guidelines and Methodology for Collection and Reporting of data on Potential Created and Area Irrigated from Major, Medium and Minor Irrigation Schemes", which was set up in 1983 under chairmanship of Secretary(WR). The report of recommendations on rationalisation and generation of irrigation statistics was submitted to the Planning Commission in 1988.

The main recommendations of the Committee of above Working Group on Rationalisation of Statistics and methods of assessment of Irrigation Potential and Utilisation are:

(i) A unified procedure should be adopted by all the States for collection of irrigation statistics in respect of major, medium and minor schemes.

(ii) Standard proformae for collection of Statistics in respect of major, medium and minor schemes should be adopted for use by all the States.

(iii) To avoid discrepancies in the irrigation area, the work of Irrigation Department and that of Revenue Deptt. should be complementary to each other and should be co-ordinated by the State Planning Unit/Economic & Statistics Dte. having statistical officers at the District level.

(iv) Sourcewise classification of irrigated area should be amplified to give separate figures for major, medium and minor sources and for surface and ground water sources.

(v) Besides above, a number of other recommendations about setting up statistical units in State Irrigation Deptts., one Statistical Supervisor should be provided in each tehsil, a Statistical Unit should be provided at district level, training programme, use of computers etc. were made. The above recommendations do not appear to have been implemented for collection and compilation of irrigation statistics.

In case of hydrological data, the practices and procedures followed by Central and State Organisations are not uniform. Timely documentation of available data is another handicap. The existing network is also inadequate in some of the river basins. The general interest in hydrological data collection from remote and some times inaccessible site is lacking and there is general tendency to switch over from hydrology to construction site or even accept posting in Planning & Design Organisations. The hydrological works remain under-funded and the major chunk is allocated to construction projects.

9.5 Suggestions for Improvement

9.5.1 Hydrological Data Base

(i) Planning, development, design and management of river valley projects require detailed knowledge of hydrological characteristics which can be derived from adequate and reliable data base. The institutional and technical capabilities of the Central and State organisations to measure, collate, analyse, disseminate and use the data are required to be strengthened.

(ii) Improvement in processes and procedures, standardisation of criteria and quality control is

necessary for the sake of uniformity and integrity of the data collected by different organisations.

(iii) Facilities for efficient handling of voluminous hydrological and meteorological data require improvement by running specialised Hydrological Data Management Computer Programmes.

(iv) State and national data centres for storage, retrieval and dissemination of hydrological data may be set up in each State.

(v) Rapid transmission of data is another important aspect and DISNIC facilities could be used to transmit the data to State Headquarters and National Data Centre. These States and Central Data Centres should also have interactive facilities for accessing data from each other.

(vi) For building up specialisation in data collection and interpretative scientific work the people working in difficult conditions should be given certain incentives and better career prospects.

9.5.2 Land Use Statistical Data Base

(i) Measures should be initiated for implementation of recommendations of the Working Group on "Guidelines and Methodology for Collection and Reporting of Data on Potential Created and Area Irrigated from Major, Medium and Minor Irrigation Schemes". This requires concerted efforts on the part of the States to initiate the process of district/project level verification of the figures through better co-ordination between the concerned officials of the State Departments. Planning Deptt. may Co-ordinate such activities as envisaged in the recommendations.

(ii) Process of visiting the States by CWC for reconciliation of irrigation statistics through mutual discussions with the concerned State authorities should be given more thrust.

(iii) Detailed irrigation Census on the lines of Agriculture Census to have the strong data base for the sector may be conducted. While the data on net irrigated area by different sources is available for all the States, the gross irrigated area has been reported to Ministry of Agriculture by a few States only.

(iv) Avail the facility of DISNIC Network of the National Informatics Centre (NIC) at district level. Irrigation Statistics at district level should be available in the network at district Headquarters, which could be compiled at State headquarters for onward transmission to Central authorities. For this purpose, the Central authorities should have direct access and connection with the computer terminal of State Data Bank

at State Headquarters/capitals through DISNIC from where the data can be directly transferred to Central authorities. This may cut short the time lag.

(v) There are two recognised agencies viz. Directorate of Economics and Statistics and Directorate of Land Record in each state accountable for collection of Land Use Statistics which inter-alia includes statistics of irrigated area also. In addition, similar data is also maintained by the respective state Irrigation Departments. However, there is variation between the data of Irrigation Departments and those of Land Use Statistics. It apparently arises due to lack of proper interface/interaction among the concerned agencies. To overcome this problem, it is considered necessary to develop proper mechanism and interface among these agencies to ensure a single line of data flow to both the ministries of Agriculture & Co-operation and Water Resources. Keeping in view the importance and need to maintain uniformity in the relevant data being generated by different agencies, it may be useful to convene a top level meeting of officials of concerned Departments of States, Union Ministries of Rural Areas and Employment, Agriculture & Co-operation and Water Resources. Funding of additional staff to take up this work by the Ministry of Water Resources may also be helpful.

(vi) The area under water logging salinity/alkalinity and other flood induced drainage problems are not assessed on regular basis. The latest information available is upto 1991-92. Planning and prioritising of agricultural drainage projects could be needed in these areas in near future to make up for the opportunity loss for agriculture development induced by inadequate drainage. Assessment of such area should be undertaken while updating the Land Use Statistics. CWC can take up the work in collaboration with the State Government.

9.5.3 Planning, Design and Monitoring Capability

(i) The planning process involves identification of the resources, their quantification in time and space both in absolute and quality terms, present utilisation and future requirements in atleast 50 years perspective. Preparation of a Master Plan is necessary which should inter-alia include a complete inventory of the resources and their distribution. Planning must take into account the carrying capacity (threshold limit) of a river system with emphasis on sustainability rather than leading to environment degradation problem by unthoughtful exploitation. The greater the scale and complexity of development, it is more likely that the hazards associated with the water environment are inadequately regarded. Short term and commercial interests in decision making have often overlooked the hydrological, geomorphologic and ecological continuum as a complex system from the watershed to the sea. The local

decision making should encourage sustainable activities while discouraging the unsustainable ones. Detailed Master Plan will help picking up the most needy projects out of many available options for the well being of the society. In order to remove the imbalances the weaker sections, tribal areas and remote backward regions identified in the Master Plan could be given a thrust by fixing up inter-se-priorities rather than making random choices. The State Planning Departments/authorities are expected to provide necessary policy directions and make institutional arrangements for selection of projects on this principle to make better use of the available resources.

(ii) Having identified the project on above considerations, it is necessary to undertake detailed investigations for preparation of as realistic project estimates as possible. It has been experienced that most of the projects are prepared using inadequate and sometimes unreliable data - a practice which has an inherent risk of delay in construction, cost over-run and above all the project failure. The Central Water Commission has issued the guidelines for investigation of major irrigation and hydro-electric projects including preparation of project estimates. The Water Management Division of the Ministry of Agriculture has brought out technical bulletins for assessing the water requirements of the crops. The environmental and ecological aspects which are to be covered in the Project Reports have been outlined in the guidelines. Apart from above, the Bureau of Indian Standards has prepared a number of standards and Codes of Practices for carrying out investigation of projects and preparation of detailed Project Reports. These cover a number of subjects such as details of topographical surveys to be carried out, organisational set up required for carrying out investigations and methodology for preparation of Project Reports.

By and large, the projects prepared are not in conformity with the guidelines and procedures. These do not contain the data and details required for a proper appreciation of the proposal and its technical and economical assessment. This results in protracted correspondence between the States and various Central Agencies charged with the task of techno-economic scrutiny of the projects. The project investigation and estimation activities are not considered with due seriousness they deserve and who-so-ever available or easily separable is deployed for the job despite the fact that the success and failure of the project depends upon reliability and integrity of the data collected during the investigation. It is necessary that qualified and technically competent people are put on these assignments and given incentives by way of extra remuneration and preference for promotion etc. to attract the best available talent. The facilities for project investigations also require use of modern survey & data

collection instruments and site equipment. The staff handling such equipment should be properly trained to acquire proficiency in the work. Each State should have a project investigation/ data collection unit equipped with these facilities as well as with the latest guidelines, standards and code of practices to be maintained at the site office. These should also have proper communication system to remain in touch with headquarters for guidance and own welfare.

During the investigation and estimation stage, occasional inter-action with the Central Organisation responsible for project appraisal can be useful for corrective action with eventuality of going wrong somewhere. This would avoid delays, on account of rechecking the data at a later stage, facilitate accurate processing, analysis and its interpretation. The process of survey work and data collection should be checked by superior authorities and such test checking made mandatory as practised at construction stage to ensure that incorrect data gathered by procedural short cut could be timely done away with.

(iii) Project Planning & Investigation Units in the State Irrigation Departments have to take into account all aspects involved in collection of Data including the Socio-economic status, environmental problems and rehabilitation & resettlement besides the required engineering parameters. The project planning hitherto takes care of projects construction and related activities only and generally tend to defer the important areas like operation, maintenance and management as post project activities. A sound planning should try to visualise the project in its holistic form and highlight the most tenable approach to these inevitable needs in view of the fact that the local conditions generally vary from project to project basis. Involvement of beneficiaries at the investigation stage can preclude or at least foretell the controversial issues likely to arise sooner or later for attempting amicable redressal. Specific guide lines are available covering most of these activities and Project Planning Units should cover them in relevant chapters of detailed project reports.

(iv) Design of projects is an important aspect and involves specialised skill. Reliability of Data used for design purpose is of vital importance to ensure that the project and its components meet the required structural strength and safety considerations. Most of the State Governments have set up their own design organisations. It is necessary that the design capabilities of these organisations are updated from time to time through various training and computer aided programmes. Designers should also associate themselves with field investigations at suitable intervals to ensure that the data required by them is being properly collected. Specific requirement for the purpose of design could be furnished by them so that data gaps at the later stage could be minimised. The

designs prepared should include detailed features of the main and appurtenant structures. The structural and hydraulic design calculations should also be furnished for checking the proposal by the Central Agencies.

The design criteria for several types of structures is already available in the form of BIS specifications standards and should be uniformly adopted. Use of empirical relations has to be avoided unless there is no other alternative available to acquire the data and work out the details. For stability analysis, the loading diagrams considering various conditions of Water level, earthquake, drainage and other forces/ stresses considered should be included in the details furnished with the proposal. All these details will facilitate the appraising organisation at the Central level to go into the design details without seeking time consuming clarifications from the field units.

The designer should have detailed discussion on construction drawings with the Project Authorities to ensure that the site engineers are fully conversant with the interpretation of the design details. Modification of drawings may become some times necessary in view of site requirement during construction stage. Each such case require thorough investigation before modifications are carried out. Design backup and periodical site visit of the designer will ensure proper co-ordination and follow up of the structural specifications.

The designers should also have adequate field exposure to appreciate the orientation of the site, its geo-physical conditions and the general natural conditions about the availability of materials etc. The work of the designer does not involve field hazards & strains. It is mostly of desk type, requiring quick grasping and perceptions of the project before and after its construction. In order to attract qualified and specialised professionals, the designers should also be given incentives by way of extra remuneration and benefits of promotion.

Those States which do not have well organised design wings could refer their proposal to the Central organisations with all required data and information. In order to improve the design practices, the experience of different State and Central Organisations should be shared and exchanged in common forum from time to time. The design evolved, if exchanged at official level would improve each other's capabilities and benefit both the Central and State design Units.

(v) The main objective of monitoring is to review the progress of the project, identify the reasons for shortfall, if any, and to suggest and assist in taking remedial measures. Monitoring is considered to be a management tool to ensure timely completion of the project. Thus, apart from bringing out project specific

difficulties etc. , it also needs to bring out any changes in organisational procedure necessary for smoother management of the project.

In nut-shell, monitoring of a project is a systematic effort to :

- Set performance standards
- Ensure implementation of the construction programme
 - Review the organisational and management capabilities of the project organisation and procedural difficulties being faced by them
 - Compare actual, physical and financial achievements with the set targets
 - Identify deviations, shortfalls, lagging areas etc., occurred and anticipated alongwith their effect on the overall implementation programme and inter-related activities and analyse their causes
 - Suggest corrective measures for overcoming the bottlenecks/problems
 - Review the project, suggest modifications in the implementation procedures, programme and targets
 - Compile the information on the physical and financial status

The CWC has evolved guidelines for monitoring of irrigation projects and reorganised its functions to undertake the monitoring activities of the State projects on uniform pattern. Apart from monitoring the physical and financial progress, the CWC is also carrying out the review of the management system including procedures used by the construction agencies. The information is collected during discussions with project engineers in the field as well as from records available in the project offices. Based upon this, the status report of the project is prepared for review of the project activities. The critical issues are identified for further clarification and discussion. The deviations and slippages of the projects are recorded to determine causes for taking remedial measures by the project authorities. Such monitoring is useful to maintain the technical standards, specifications and financial disciplines for timely completion of the project.

Monitoring by Central Organisations alone may not result in required construction improvement and physical/financial progress unless there is a strong will on the part of the project authorities to comply with the suggestions brought out in the status report. It would greatly strengthen the hands of the Central Monitoring Authorities if release of funds is linked with the compliance on the status reports prepared by them. For proper inter-action with the State Departments, a Monitoring cell at the State level as well as small unit at project level would be useful to ensure compliance on the deficiencies pointed out in the monitoring reports. The State/Project Monitoring Units can overview the

progress periodically , inspect all the works in progress and exercise quality control. Monitoring Units of Central Water Commission will inspect at least the major and critical works. This three tier monitoring when put together in similar format would provide a comprehensive information on all project activities to keep track of the follow up action by Project Authorities.

There are certain activities like land acquisition, environmental management and social problems which do not fall under the direct purview of Project Authorities. The deficiency/slippage in time schedule which can eventually affect the project are to be resolve at appropriate level. The Monitoring Organisation of Central Water Commission shall take up such issues with the State Government for expeditious action. The proceedings of Project level Committee meetings can provide useful information input to the Monitoring Organisation and the Project Authorities should keep the CWC field units posted of the latest development.

(vi) The present system of generation and dissemination of data in respect of irrigation projects does not permit real time monitoring of inflows of water and its utilisation through the canals and its distributory systems. Information regarding inflows and its utilisation reach the decision making level of the Chief Engineer and the Government very late, making it impossible to make mid course corrections in the performance of the irrigation systems. Therefore, in the interest of the proper and efficient water management, installation of computer based appropriate Geographical Information Systems (GIS) is considered necessary for all major and medium projects to enable irrigation department at appropriate levels to monitor on day-to-day basis the inflows and utilisation of water. Similarly, there is a tendency to suppress areas brought under the irrigation under major systems. Therefore, in addition to conventional recording of crops under cultivation, the Remote Sensing Technology should be brought into use to report periodically the actual extent of area brought under irrigation under the commands of major & medium irrigation projects.

(vii) Project Planning, Design and Monitoring Units at State levels generally fall under the same umbrella organisation and their regular inter-action at investigation, planning, design, construction and monitoring stages is expected to improve the quality of work and avoid slippage of construction schedule. Such an inter-action should be mandatory within the State as well as with Central Government Organisations at regular intervals. These units should be suitably strengthened with qualified and trained manpower alongwith necessary infrastructural support to improve their capabilities. The States, which do not have such separate unit, should initiate action to create them or carve out of the existing organisation strength on selective basis.

CHAPTER-X

MOBILISATION OF ADEQUATE RESOURCES FOR THE SECTOR*

10.1 Introduction

10.1.1 Adequate, assured and timely irrigation is a critical determinant of agricultural productivity. In the Indian context, irrigation plays an important role in increasing agricultural production and productivity. The role of irrigation in increasing agricultural production is all the more greater in the present Indian conditions where available land suitable for cultivation has almost been exhausted. The net cropped area has hardly changed during 1970-71 to 1992-93 (from 140.3 to 142.51 million hec. in 1992-93 (provisional)). In fact, agricultural growth during the last two decades or so has mainly depended upon expansion of irrigated Command which has contributed to increasing the productivity and expansion of gross cropped area (cropping more than once every year on the same piece of land). The gross cropped area has expanded from 165.8 million hec. in 1970-71 to 185.5 million hec. in 1992-93 (provisional) or say by 19.7 million hec. or about 0.9% growth per year.

10.2 Justification for Allocation of Realistic outlay for Irrigation Sector

10.2.1 The expansion in irrigated area has led to enhanced use of high yielding varieties of seeds, fertilizers and other associated/related inputs facilitating higher rates of growth in yield, particularly in the post green revolution period. Further increase in production of foodgrains will have to much depend on irrigated land.

10.2.2 Apart from the direct benefits from the irrigation projects mainly in the form of increase in agricultural production and productivity through increase in area under irrigation/yield and direct employment generation on on-farm activities and in project construction, operation and maintenance, the irrigation projects lead to various indirect and intangible benefits, such as, enhancement of land value, establishment of agro industries, effects of irrigation on fisheries, wild life, ecology, etc. in the area, improvement in transport and communication and other infrastructural facilities (such as marketing and institutional finance and cooperatives) weather modification, reduction in dust storms, etc. and other miscellaneous revenue receipts from the project areas, improvement in level of education and literacy rate, etc. Besides these projects create indirect employment (outside the on-farm and in the construction of the project).

10.2.3 From the above, it is clear that irrigation sector in the Indian context has played and will continue to play an important role in the near future. Realising the various

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advantages of these projects, the States have taken up a number of irrigation projects in the successive Five Year Plans.

10.2.4 The position of major and medium irrigation schemes taken up and completed during the various plans and the plan-wise financial expenditure on irrigation is given in the succeeding paragraphs

10.2.5 The table below shows the number of Major and Medium Irrigation schemes taken up and completed during various plans and the balance carried over to the next plan.

10.2.6 It can be seen from the table that proliferation of projects or in other words, major distortion leading to thin spreading of resources started during Fifth Plan when 70 major and 300 medium schemes were taken up. This should be seen in the background that when V Plan started as many as 97 major and 130 medium schemes were under execution. Their total estimated cost was of the order of Rs.4842 crores with a spillover cost into V Plan of Rs.2902 crore while the total Fifth Plan outlay was only Rs.2442 crores which was not adequate to complete those ongoing schemes which were continuing from previous plans. The cost of new major projects taken up in the V Plan alone was Rs.8136 crores.

10.2.7 More and more projects were taken up in subsequent plans to satisfy the local needs, to reduce the regional imbalance and for ever increasing demand of food production due to population growth. As matching funds were not allocated, it resulted into the thin spreading of limited resources in Irrigation Sector which continued in later plans with consequent time and cost overruns. Only 36 major, 105 medium and 21 Extension Renovation and Modernisation (ERM) schemes are likely to be completed during VIII Plan which is likely to leave large number of schemes spilling into IX Plan. At the beginning of VIII Plan, there were 158 major, 226 medium and 95 ERM ongoing schemes with a total spillover cost of Rs.40,563 crores whereas the total outlay provided for major and medium irrigation sector was only Rs.22414.5 crores which was 55% of the spillover cost of all the ongoing projects. Paucity of funds due to less allocation in the irrigation sector in various plans has thus resulted in non-completion of schemes identified for completion thereby, resulting in reduced creation of targetted potential.

10.2.8 Allocation to Irrigation Sector and particularly to Major and Medium Irrigation has been dwindling since Second Plan and has reduced from 19% in the First Plan to only 5% of the total plan outlay in the VIII Plan as given in the following table:

PLAN-WISE FINANCIAL EXPENDITURE ON IRRIGATION

Sl. Period No.	Major & medium Irriga- tion(Cr.)	Total Irri- gation (Cr.)	Total Plan expndt. All Sector (Cr.)	%age of expenditure	
				Irrigation total	Major & Medium total
1. First Plan (1951-56)	376.2	441.8	1960	23	19
2. Second Plan (1956-61)	380.0	541.6	4672	12	11.6
3. Third Plan (1961-66)	576.0	1019.4	8577	12	7
4. Annual Plan (1966-69)	429.8	996.7	6625	15	6.5
5. Fourth Plan (1969-74)	1242.3	2415.7	15779	15	7.9
6. Fifth Plan (1974-79)	2516.2	4073.4	28653	14	8.8
7. Annual Plan (1978-80)	2078.6	3275.8	22950	14	9
8. Sixth Plan (1980-85)	7368.8	11528.8	109292	11	6.7
9. Seventh Plan (1985-90)	11107.3	18734.2	218730	9	5
10. Annual Plan (1990-92)	5458.18	9108.3	123120	7	4.4
11. Eighth Plan (1992-97) (Outlay)	22414.5	30901.9	434100	7	5

10.2.9 From the above, it will be observed that despite the crucial role of irrigation sector in India, the plan wise financial expenditure on irrigation as a percentage of the total plan expenditure (all sectors) has drastically come down, more particularly, in the case of major and medium irrigation. The inadequacy of funds has resulted in non-completion of various schemes resulting in reduced creation of targetted potential. It is anticipated that only 36 major, 105 medium and 21 ERM schemes are likely to be completed during the VIII Plan period and the remaining projects/schemes would spill over to the IX plan period. Due to reduced allocation of funds for irrigation sector, problems have cropped up in mobilising the required resources to complete even the on-going projects not to talk of taking up of new projects. Unless immediate remedial measures are taken, it will not be possible to exploit this sector to the desired extent.

10.3 RESOURCES REQUIRED FOR MAJOR AND MEDIUM IRRIGATION DURING THE IX FIVE YEAR PLAN :

10.3.1 The experience during the plan periods shows that the elasticity of agricultural output growth to irrigation input is unity i.e. for any targetted growth in agricultural output, a similar growth is to be planned in respect of irrigation also.

10.3.2 Five Year Plans have in general, targetted for a 4 percent rate of growth in agricultural output. In view of on-going policies of globalisation and liberalisation and need to step up exports of agricultural output in a big way, the IX Plan target for the agricultural growth has to be much higher than 4% per annum. However, for the purpose of the present exercise, it is assumed that the targetted growth of agricultural output in the IX Plan period would be at least the same as before i.e. 4% per annum or around 20% for the IX Plan period.

10.3.3 On the above basis, the area under irrigation over the IX Plan period has to grow by at least 20%. It has been observed that in the past and more so in the recent past, the irrigated area from minor irrigation sources has been increasing much faster than that from major and medium irrigation sources. The possibilities for further increase in the irrigated area from minor irrigation sources are in the future not likely to be the same. The gap between ultimate irrigation potential and the actual irrigated area is much higher in the case of major and medium irrigation when compared to minor irrigation sources. Besides, there is a high complementarity between the major and medium irrigation on the one hand and minor irrigation on the other hand. Indeed, it would be difficult to increase the area under minor irrigation without significantly augmenting the major and medium irrigation sources. It is, therefore, assumed that area under major and medium irrigation has to grow at least at the same rate at which minor irrigation has been increasing in the past. This would considerably redress the existing imbalances between these two sources of irrigation.

10.3.4 It follows from the above, that the area irrigated from major and medium irrigation sources needs to grow as per targetted growth of agricultural output i.e. at least 20% during the IX Plan period. The irrigation potential created from the major and medium irrigation sources at the end of VIII Plan is likely to be around 34 million ha. which has to be increased by at least 6.8 million ha. or 7 million ha. The combined cost per hectare for major and medium irrigation projects is estimated to be around Rs. 70,000/-. On this basis, the required outlay for major and medium irrigation during the IX Plan period comes to around Rs. 49,000 crores or say Rs. 50,000 crores. This is the minimum outlay which may be necessary for meeting the requirements of agricultural output and redressing the existing imbalances in the exploitation of irrigation potential from different sources.

10.4 Modalities for Raising the Resources

10.4.1 The strategy and size of Ninth Plan for the major and medium irrigation sector would largely depend on the overall plan size and likely share of the major and medium irrigation sector viz-a-viz the programmes of the States to complete the ongoing projects and requirements of funds therefor.

10.4.2 Presently the irrigation projects are being approved on the basis of their economic viability. Considering the various advantages of these projects as already mentioned earlier, the investment on such projects may have to continue until the ultimate irrigation potential is achieved.

10.4.3 Suggestions of this Sub-Group for mobilising the resources for this sector in the Ninth Five Year Plan are given below :

i) Increase in Plan allocation for this sector:

Due to the large number of ongoing projects where considerable investments have already been made there is imperative need for their early completion to tap the economic gains from these projects at the earliest. To keep pace with the demand of increasing population for food, fibre and for sustained economic growth the remaining irrigation potential will need to be created in a phased manner. For this purpose new projects will also need to be taken up in IX and subsequent plans alongwith the priority for completing ongoing projects. It is suggested that to meet the full requirements of the major and medium irrigation sector an outlay of around 10 to 15 % of the total plan outlay may be provided depending upon the overall size of the Ninth Five Year Plan. It also needs to be ensured that resources are not diverted from the purpose for which they are allocated. Therefore earmarking of funds for the specific projects and their effective monitoring will need to be ensured.

ii) Weightage for allocation of central assistance for States Plan:

In the original Gadgil formula of 1969 weightage of 10% was given for ongoing major irrigation and power projects. Since the modified Gadgil formula of 1980 and in the subsequent formula, this weightage is not being given. As a result, relative share of major and medium irrigation in total resources kept declining over the years. At this stage keeping in view the importance of this sector, this sub-group opines that weightage of 10% for ongoing major irrigation projects in central assistance to States may be given and the release of such funds be linked with the states meeting their own commitments in regard to the allocation of resources to this sector.

iii) Re-structuring of irrigation charges

It is well known that the receipts from irrigation projects are not only meager but they constitute a negligible proportion of the value of produce per hect. of irrigated area.

While the Irrigation Commission of 1972 had emphasized that water charges should range from 5 to 12 per cent of gross value of farm produce on irrigated commands, the reality remains way below that. Presently in none of the States, water charges go accordingly. Receipts also seem to be quite insensitive to substantial gains in agricultural productivity in irrigated tracts. The Vaidhyathan Committee on Pricing of Water has referred to an assessment that indicates that the gross receipts per hectare for major and medium irrigation projects are less than 3 per cent of the value of production. They are also less than 5 per cent except in two States of the difference in the value of output per hectare in irrigated and unirrigated areas. Obviously, the States have not succeeded in capturing the gains from higher productivity in terms of better irrigation receipts. The Vaidhyathan Committee has made a number of recommendations in this regard which should be given urgent consideration. The Tenth Finance Commission is of the view that the irrigation receipts should cover not only O&M costs but also give a return of at least 1% per annum on capital. They have suggested that State Govts. should strive to achieve this goal during the forecast period (1995-2000). This Sub-Group endorses this view of the Tenth Finance Commission .

iv) Integrating Rural Development Programme with Irrigation Sector:

Main thrust of Rural Development Programme is to create employment opportunities in the rural areas and poverty alleviation. About 70% of the population is still dependent on agriculture and agriculture in turn is largely dependent on irrigation. Not only many of the irrigation works are highly employment intensive, investment in irrigation sector will also best meet the objective of increasing agricultural production. It is therefore, suggested that a portion of the Central funds for employment generation under the Rural Development Programme are utilised for irrigation sector, especially for better maintenance of existing canals and structures. These funds can be utilized through village panchayats or irrigation departments or a body consisting of farmers' (users') and irrigation authorities for employment generation in the irrigation sector.

v) Farmers' participation

In order to progressively increase the involvement of the farmers from consultation to active management of the distribution system, efforts need to be directed at building up strong and effective farmers' organisations /Water users' Associations(WUA) who could take up the responsibility of receiving the bulk supplies of water from the irrigation departments and distribute the water among the beneficiaries. The maintenance of minors (500 hec.) may specially be considered for handing over to the WUAs. This can bring about a reasonable reduction in the costs and responsibility of the Govt. agencies. Besides routine operation and maintenance the farmers' organisations/WUAs can also take up the task of collecting revenue from individual beneficiaries so as to improve upon the revenue collection. The success story of the

Water Users Associations already operating in some of the states need to be extended to other areas.

vi) Water Bonds

In order to involve the farmers' groups more effectively for a greater degree of responsibility for improved management of the system and thereby reducing the costs, they can be made co-owners of the irrigation works. This can be done through the introduction of water bonds or equity shares. A fixed percentage of capital invested in the project which may be termed as 'equity' can be offered to involve associations in the form of 'water bonds' / 'equity shares', possibly in exchange for labour contribution to project construction. The 'water bonds' / 'equity shares' issued to the farmers can be thought of as financing instruments as well as entitlement to the water. Water entitlements can be made proportional to the land area of farmers in the command.

vii) Commercial exploitation of land

As already mentioned earlier, water resources projects lead to various indirect advantages including, inter-alia increase in the value of the land, recreational facilities, etc. On the embankments of the irrigation projects the land can be developed for recreational facilities/other commercial purposes. Irrigation departments should think of leasing such lands to private sector on say 20 years basis to develop them as recreational tourist resorts. This can turn out to be an important source of generating finances for further development of irrigation in the country. Besides permission to develop tourism and pisciculture would be an added attraction for the private sector to invest in this sector. There appears to be sufficient justification for charging for these facilities on a commercial basis from its beneficiaries. Such beneficiaries of irrigation projects may also share a part of the capital cost of the projects.

viii) Multi-lateral and Bi-lateral assistance

The multi-lateral and bi-lateral assistance for the irrigation projects may not only be continued but expedited atleast until the ultimate irrigation potential is achieved.

ix) Re-structuring Management Institutions

Incentives need to be created to induce irrigation departments to take on more direct responsibility for providing higher quality irrigation service and at the same time to devolve some responsibility and power to farmers' groups. The irrigation departments and managing divisions for the larger individual systems be made financially autonomous like Corporations or regulated public utility and their income be dependent on the revenue they themselves collect for irrigation services. This will provide incentive for more regular and stricter collection of revenues from user groups and / or the supply of better irrigation service to facilitate this.

x) Funding by NABARD

The National Bank for Agriculture and Rural Development (NABARD) was established in 1982 as an Appex Level Institution for Agriculture and Rural Development. NABARD has been playing a key role in promoting the development of water resources in the country. In irrigation sector, hitherto, their scope has largely been restricted to investments in minor irrigation sources. Pursuant to the announcement made by the Union Finance Minister in the budget speech for 1995-96, a Rural Infrastructure Development Fund (RIDF) has been set up in NABARD, to which contributions to the extent of Rs. two thousand crores would be made by the Commercial Banks which have not fulfilled their priority sector lending subject to a maximum of 1.5 % of the net bank loan. So far NABARD has sanctioned Rs.1984 crores to 19 States for completion of 2492 projects out of which 2411 are for irrigation alone. These projects are expected to irrigate 2047 thousand hec. of land, contribute Rs. 2700 crores to GDP and generate 1755 lakh mandays of recurring employment, in addition to creation of non-recurring employment during construction of the projects. In principle sanction has also been accorded for Rs. 16 crores in four North Eastern States. The scheme has been well received by the State Governments. The funding under this scheme is a one time measure at present. It is suggested that this scheme may be expanded and also extended to subsequent years of the Ninth Five Year Plan. Services of funds by NABARD could be by:

(a) Under the present arrangement, commercial banks which have not fulfilled their priority sector lending (agriculture) targets are required to contribute to the RIDF upto a maximum extent of 1.5% of the net bank credit as a one time measure. The available data indicates that in the case of public sector banks and private sector banks (old) the shortfall in priority sector lending is of the order of Rs. 7300 crores. Therefore, commercial banks can contribute a reasonable amount to the RIDF every year during the IX Five Year Plan period so as to enable NABARD to finance State Governments for completing the medium irrigation projects and some of the major irrigation projects which require lesser amounts say Rs. 25-30 crores for completion. Accordingly, the Sub-Group recommends that RIDF set up in NABARD may be continued with contributions from commercial banks at least upto Rs. 500 crores per annum during the IX Five Year Plan period. While the rate of interest could be determined by RBI/NABARD depending upon the market conditions, the existing repayment period allowed to the State Governments for repayment of the loan at 5 years may be elongated to say 10 years. This will offer adequate cushion to the State Government for meeting their loan instalments with NABARD which would have to come by and large from the general revenue of the State Governments.

In addition to the above, NABARD may also be allowed to float Irrigation Bonds (tax free) to generate about Rs. 500 crores per annum or such other higher amounts as may be determined per annum during the IX Five Year Plan period, to fund eligible projects in the irrigation sector every year and

(b) channelising funds through NABARD for projects funds by Government of India so that all loans are projectised. For this, stricter monitoring of the end use of funds released will have to be ensured. Apart from the existing monitoring system, expertise available in NABARD for monitoring specific projects for an appropriate fee may also be utilised. There are certain ongoing major schemes which are likely to be completed within 2-3 years span of time creating substantial irrigation potential. As such a change in policy relating to financing by NABARD under RIDF is also suggested to include such beneficial schemes as sub-projects of major schemes. The investments made in the major projects which are in advance stage of construction will deliver goods in a big way by creation of substantial irrigation potential.

10.5. To explore possibilities of Private Sector Participation by way of Investment in Irrigation Sector.

10.5.1 So far planning, implementation and operation and maintenance of irrigation projects right from investigation stage to the distribution of water has been exclusive prerogative of the Government. Private Sector participation has been negligible so far.

10.5.2 Paucity of resources with the Centre and State Governments has been causing concern in the minds of the people whether some of the ongoing projects as well as proposed new projects will ever be completed.

10.5.3 Government of India launched upon a programme of the liberalisation of the economy since 1992. Already several structural reforms have been introduced. Government has been encouraging the private entrepreneurs in many sectors of the economy including the infra-structure sector. Privatisation in the power sector, construction of roads and bridges with freedom to levy a toll has been facilitated in many areas. Liberalisation has also taken place in other sectors like telecommunication, etc.

10.5.4 Keeping in view the trends of liberalisation policy and the steps already taken in the other sectors of the economy like power, roads and transport, telecommunication, etc. it is felt that in addition to the governmental efforts, private sector participation in the irrigation and multi-purpose projects should be encouraged. While it will be too early to assess and predict the impact of privatisation in the irrigation and multi-purpose projects, it is hoped that over the years this could go a long way in mobilising the much needed resources for the rapid development of this sector by recovering costs from the farmers to the extent possible so as to realise the ultimate irrigation potential at the earliest as well as use the available water resources efficiently.

10.5.5 Various combinations of building, owning (of structures etc.) operating, leasing and transferring may be considered. The exact type may be decided by the states as considered appropriate by them. Competitive bidding to ensure transparency and cost effectiveness may be useful. However, in order to attract private investment, some incentives will have

to be given to the private sector including avenues to augment revenues. These could be in the form of tax holidays, floating tax free revenue bonds / loans at concessional rates including moratorium on repayment, etc. The main objective should be oriented towards finding ways and means that are more efficient, user responsive and environment friendly for quicker development and optimum utilisation of country's available water resources. Private investment in this sector may initially be on a pilot basis in respect of certain projects in specific regions. The concept could be extended to more and more projects on gaining experience. Such an investment could be thought of particularly, in the case of ongoing projects which are in advanced stage of construction but are incomplete due to lack of funds. New projects may be considered for private sector participation after due investigations and obtain techno-economic, environmental including resettlement and rehabilitation and investment clearance by Government organisations. It will be appropriate for the State Governments to examine in detail legal aspects contained in the irrigation acts before going in for private sector participation.

10.5.6 Some initiatives in respect of private sector participation have already been taken in the states of Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra and Orissa. Other states may also take appropriate steps and consider private sector participation in the irrigation and multi-purpose river valley projects as a means to raise more resources for this sector. BORROWINGS FROM THE MARKET

10.5.7 Karnataka has adopted a novel way of raising resources for completion of on-going major works through the market. Krishnabhagya bonds issued by Krishna Bhagya Jala Nigam Ltd. (A Government of Karnataka Undertaking) is one such scheme that offers secured redeemable non-convertible bonds at 17.5 per cent interest. It is being promoted by Government of Karnataka with committed budgetary support primarily for completion of Phase -II of Stage- I of Krishna Project that alongwith Phase -I, will irrigate 509000 hectares of land and generate an average of 672 million units of hydro-electricity every year. Other states may also consider borrowing from the market as a means to raise resources.

CHAPTER XI

EMPLOYMENT GENERATION, TRAINING AND CAREER MANAGEMENT*

11.1 Background

Irrigation projects generate considerable amount of both direct and indirect employment. Direct employment is generated in the course of planning, construction, operation, and maintenance of irrigation projects. It covers the employment of engineers, technicians, clerks, and other skilled and unskilled workers in the irrigation works. The indirect employment of irrigation projects emerges from both the enhanced agricultural production as well as its multiplier effects in allied activities like livestock and rural non-farm sectors. The indirect or second-round employment effects of irrigation projects can be considered in terms of the three broad categories: (i) Farm employment, (ii) Livestock sector employment, and (iii) rural non-farm employment.

Although both the direct and indirect employment effects of irrigation projects are equally important for meeting the employment targets of the Ninth Plan and beyond, the indirect employment is somewhat more important in view of the following considerations:

(a) The indirect employment is crucial for meeting some of the major policy goals such as augmenting food production, rural income generation, and poverty alleviation; and

(b) It is not only larger than direct employment but also more sustaining as the indirect employment is being generated continuously over a longer period of time.

11.2 Employment dynamics of irrigation projects

The various ways in which irrigation projects generate employment in the farm sector are well known. Analytically speaking, irrigation projects generate farm employment via three routes: area effects, crop pattern effects, and productivity effects. Since irrigation projects bring additional area into cultivation, the newly irrigated lands generate additional employment. Likewise, irrigation facilities could also lead to crop pattern shifts (especially from less labour using dry-land crops like bajra and sorghum to relatively more

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labour using crops like rice and wheat) favourable for higher labour absorption in the farm sector. Similarly, since irrigation availability encourages the adoption of modern farm inputs and enhances cropping intensity (i.e., multi-season cultivation), land productivity becomes higher causing thereby more employment per unit of land area.

11.3 Norms for estimation of direct employment

The direct employment effects are estimated in two broad subheads, viz. (a) Employment in planning, design, and construction activities; and (b) Employment in operation, maintenance and repairs (OMR) activities. In effect the sub-head (a) deals with both pre-and during implementation stages of the project and sub-head (b) deals with post-project stage of the project.

11.3.1 Employment Generation in Construction:

A study carried out during 1995 on the basis of employment generation in 43 projects spread over various parts of the country indicated an actual employment of 1.64 lakh person years against an actual expenditure of Rs.1234.38 crores during the period from 1988-89 to 1992-93. The study comprised of 21 major projects costing a total of Rs. 1150.37 crores creating 1.39 lakh jobs and 22 medium projects costing a total of Rs. 84.01 crores creating 0.25 lakh jobs. For every crore of rupee spent on major projects the employment generated was about 121 persons. For medium projects it was 298 persons per crore of rupees spent. Weighted average employment per crore of rupees works out to 133 person-years. Further, the result of analysis with regard to various categories of personnel employed in major and medium irrigation projects is indicated in Table-11.1.

Table-11.1

Categories of Personnel		Employment in		Weighted Average for Major and Medium Projects (%)
		Major Project (%)	Medium Project (%)	
1	Engineers	5.50	1.58	5.23
2	Other Technical	8.41	5.50	8.21
3	Skilled and Semi Skilled	15.24	15.19	15.23
4	Unskilled	49.39	67.27	50.62
5	Clerical	21.46	10.46	20.71
	Total	100.00	100.00	100.00

11.3.2 Employment Generation in Operation, Maintenance and Repair (OMR) :

While the norm for employment generation in execution of irrigation projects has been per crore of rupees spent thereon, such norm for OMR is generally worked out on the basis of either CCA or annual irrigation per ha. By and large, an irrigation division is required for 40,000 ha. to 60,000 ha. depending upon the location, age and intensity of irrigation, etc. of the project. This norm also varies from State to State. In order to arrive at an average figure across the country, one division for 50,000 ha. of annual irrigation has been assumed in working out the norm.

The strength of an irrigation division also varies from State to State, more so because in some States the work pertaining to assessment and collection of water rates rests with the Irrigation Department while in some States water rates are collected by the Revenue Department along with the land rent and/or other charges. Details on all such issues are hard to get by and hence the norms have been evolved taking into consideration the strength and pattern of staff in Bihar and Maharashtra States. It includes the proportionate strength of corresponding category of personnel employed in the concerned circle and chief engineer's establishment. It is shown in Table-11.2.

Table-11.2

Strength and Pattern of Employment in OMR

Category of Personnel	Nos. engaged in OMR of 50000 Ha	Percentage of total strength	Nos. engaged in OMR per .000 Ha
1. Engineers	18	7.59	0.36
2. Other Technical	14	5.91	0.28
3. Skilled and Semi-Skilled	60	25.32	1.20
4. Unskilled	120	50.63	2.40
5. Clerical	25	10.55	0.50
Total	237	100.00	4.74

11.4 Norms for estimation of indirect employment

11.4.1 Norms for On-Farm Employment

The employment norms for evaluating the on-farm employment effects of irrigation projects are well developed and widely used. As for instance, the 1976 National Commission on Agriculture, in its employment

projections, has used 45 person-days/ hectare as the norm for estimating the additional on-farm employment due to irrigation. However, according to more recent studies conducted in various irrigation projects in different parts of India, the additional employment generated by irrigation development ranges from 32 to 179 person-days/ha. depending upon regional variations in crop pattern, farm technology, etc.. As a way of normalising for such regional variations, one is justified to use an average 50 person-days/ha. as the norm for projecting irrigation-induced additional on-farm employment.

11.4.2 Norms for Livestock Sector Employment

Case studies conducted at the Institute of Economic Growth, Delhi University Enclave have shown that with the help of survey data from one canal and one rainfed village in Tiruchirapalli District, Tamil Nadu, it is possible to empirically calculate the norm for the irrigation-induced additional livestock employment. The details are given in Table 11.3 this paragraph. On comparison the CEU/ha. in the canal and rainfed villages, it is seen that canal irrigation leads to an additional 0.40 CEU/ha. Similarly, by comparing person-days/CEU in the canal and rainfed villages, it is found that irrigation leads to an additional 0.40 person-days/CEU. Based on these two measures, it is possible to show that the additional livestock employment due to irrigation is approximately 10 person-days/ha.

Table-11.3

Livestock Sector Employment in Canal and Rainfed villages, Tiruchirapalli District, Tamil Nadu, 1992-93

Village	Area (Ha)	Livestock (CEUs)	CEU/Ha (3)/(2)	Pds/CEU	Pds/ha (4)/(5)
1	2	3	4	5	6
Canal Village	75	141	1.86	29.11	54.14
Rainfed Village	124	190	1.54	28.71	44.21
Difference	-	-	0.32	0.40	9.93

Although this norm for the irrigation induced additional livestock sector employment is based on micro information from a single region (Tiruchirapalli District in Tamil Nadu), it is considered to be realistic and particularly relevant for the instant purpose.

11.4.3 Norms for Rural Non-Farm Employment

In the case studies conducted in the Cauvery Command, the difference between non-farm person-days per ha. in the canal village and that in the rainfed village was found to be 45.66 person-days/ha. Keeping in view the fact that irrigation based agriculture and allied non-agricultural activities (rural non-farm activities) in Cauvery Command is far ahead in the command areas of most of the irrigation projects, more so in case of relatively new projects, it was found prudent to adopt only 25 person-days per ha. for estimating and projecting the irrigation-induced additional non-farm employment. This is not far out from what is estimated indirectly by multiplying the person days employed in agriculture by 0.2452695 which is the ratio of person-days employed in non-agriculture to agriculture for Rural Bihar in the 38th. round National Sample Survey for 1983, realising the fact that rural Bihar is lagging far behind other States in such developmental activities.

11.5 Additional employment generation in IX plan

11.5.1 Direct Additional Employment

The Working Group on Major & Medium Irrigation Programme for VII Five Year Plan had noted that the unrealised irrigation potential of on-going schemes was as much as 13.00 M.Ha. Out of this, only 3.08 M.Ha. is likely to be created by the end of VIII Plan. Therefore, all out efforts need to be made to create the balance of unrealised irrigation potential of 9.921 M.Ha. (13.00 M.Ha.-3.08 M.Ha.). Since construction of micro distribution network particularly field channel is not likely to be fully completed, the target could be prudently brought down to 7.50 M.Ha. which is just 75% of the balance potential of VIII Plan.. In other words the pace of potential creation will have to be accelerated from 0.60 M.Ha. per annum to 1.5 M Ha per annum in the IX Plan and subsequent plan periods. Unless this is done, the ultimate irrigation potential of 58.5 M Ha through Major & Medium irrigation schemes is not likely to be achieved even by the year 2025 AD. It has to be realised that the pace of development would be slower after completion of the on-going schemes as by and large, there is an embargo on sanction of new schemes. Even otherwise, the prospect of implementing major river valley projects in the country is getting constrained due to variety of problems.

During the VIII Plan a sum of Rs. 15858 crores has been spent (up to 1995-96) to create an additional irrigation potential of 2.302 M.Ha. Thus, the cost per ha. works out to Rs. 68,888. Realistic estimate of cost on spill-over schemes has not been made available and therefore, it has been decided to estimate employment potential assuming that 7.5 M.Ha. of irrigation potential would be created during the IX Plan and the cost per ha. will be Rs. 70,000. This is more or less as observed in the first four years of VIII Plan. This will, however, be subject to revision on finalisation of size of the IX Five Year Plan.

11.5.1.1 Direct Employment Generation Due to Construction

The expenditure likely to be made during the VIII Plan period on Major & Medium Irrigation Sector is of the order of Rs. 22,320 crores. During the IX Plan, the total required outlay for this sector shall be of the order of Rs. 52500 crores for crating an irrigation potential of 7.5 M ha @ Rs. 70000 per ha. Thus, the additional investment shall be Rs. 30,180 crores (Rs. 52500 crores - Rs 22320 crores) to be made in the next five years. The present value of this investment works out to Rs. 18500 crores. The additional employment generation through this investment is shown in Table/11.4.

Table-11.4

Employment Potential of various categories of Personnel due to construction

Categories of Personnel	Employment Potential (%)	Employment Potential (Pys)
1 Engineers	5.23	128684
2 Other Technical	8.21	202007
3 Skilled and Semi-Skilled	15.23	374734
4. Unskilled	50.62	1245505
5. Clerical	20.71	509570
Total	100.00	2460500

Note: Pys = Person-years

11.5.1.2 Direct Employment Generation due to OMR

Additional Irrigation potential proposed to be created during the IX Plan is 7.5 M.Ha. (cumulative during the plan). Assuming that approximately 1.5 M ha of potential is created in each year of the plan and its utilisation takes place at the rates of 10%, 20%, 40%, 60%, and 80% i.e., only 10% of the potential created in a year will be utilised during that year and in the following years of the Plan the development will take place at the rates of 20%, 40%, 60% and 80% during 2nd, 3rd, 4th and 5th year of Plan. With these assumptions the actual utilisation of irrigation potential (for details, please refer Annexure-11.1) to be created during IX Plan will be 6.75 M ha (yearwise utilisation will be 0.15, 0.45, 1.05, 1.95 and 3.15 M Ha). In other words, full utilisation of irrigation potential created during the IX plan. Adopting the same assumptions and methodology as in case of irrigation potential to be created during the IX Plan, it is found that the annual utilisation of Irrigation potential created during VIII Plan will be 0.06, 0.18, 0.42, 0.78 & 1.26 M ha and 1.80, 2.28, 2.64, 2.88 and 3.08 M ha in subsequent five years of X Plan (utilisation of unutilised irrigation potential of 4.42 M ha at the end of annual plan 1991-92 has not been considered here, even though substantial portion of it will be utilised during IX Plan.).

For estimation of likely OMR expenses, annual utilisation of 6.23 M ha (3.15 M ha+3.08 M ha) during the last year of IX plan has been assumed. Thus on the basis of norm developed in Para 11.3.2, the annual employment potential for various categories of personnel is given in Table-11.5.

Table-11.5
Employment potential of various categories of Personnel
due to OMR in 6.23 M.Ha. Area

Category of Personnel	Nos. engaged in OMR per .000 Ha.	Annual Employment Potential (Pys)	Employment Potential in IX Plan (Pys) (3)x5	Employment Potential (%)
1	2	3	4	5
1. Engineers	0.36	2243	11215	7.59
2. Other Technical	0.28	1744	8720	5.91
3. Skilled and Semi Skilled	1.20	7476	37380	25.32
4. Unskilled	2.40	14952	74760	50.63
5. Clerical	0.50	3115	15575	10.55
Total	4.74	29530	147650	100.00

Note: Pys = Person-years

11.5.2 Indirect Additional Employment

Estimation of indirect additional employment shall be made on the basis of irrigated area which shall be available during each year of the IX Plan. In the preceding paragraph, for each year of the IX Plan, estimates of annual utilisation of potential already created in VIII Plan and likely to be created in the IX Plan have been made. The sums of annual utilisation's of the above mentioned two potentials are 12.68 M ha and 6.75 M ha respectively. Hence, the total utilisation of 19.43 M ha during the Plan shall be the basis of computing indirect additional employment.

11.5.2.1 Estimate for Potential of the On-Farm Employment

In the Para: 11.4.1, the norm for projecting irrigation-induced additional on-farm employment has been developed as 50 person-days per hectare of irrigation. On the basis of this, the potential employment works to 971.5 million person-days. This shall be converted in to person-years by dividing the above figure by 273 C [i.e. the norm usually used for converting person-days into Standard Person Years (SPYs)]. Thus, the employment potential due to irrigation-induced on-farm activities works to 3.56 or 3.60 person-years (for details, please refer Annexure-11.2). Using the norm and the methodology adopted in the report of the Working Group on VIII Five Years plan the employment potential works out to $7.5 \times (0.75/2) \times 50 \times 5 = 703.125$ million person-days against 971.5 million person-days worked out above. In terms of person-years, it will be 2.57 million person-years against 3.60 million person-years.

11.5.2.2 Estimate for potential of the Livestock Sector Employment

In the para: 11.4.2, the norm for the additional livestock employment due to irrigation has been developed as 10 person-days per hectare of irrigation. using this norm, the additional employment potential for this sector works to 0.72 or say 0/.70 million person-years.

11.5.2.3 Estimate for Potential of the Rural Non-Farm Employment:

In the Para: 11.4.3, the norm for additional employment under this sector has been developed as 25 person-days per hectare of irrigated farming. Using this norm, the

additional employment potential of the sector works to 1.78 or say 1.80 million person-years.

11.6 ADDITIONAL EMPLOYMENT GENERATION DURING IX PLAN

Direct employment generation is likely to be 2.61 million person-years (2.46 million person-years in construction & 0.15 million person-years in OMR).

Indirect employment potential is expected to be 6.10 million person-years comprising 3.60 million in On-farm activities, 0.70 million in Livestock activities and 1.80 million in Non-Farm activities.

11.7 ADDITIONAL RURAL EMPLOYMENT IN IRRIGATED AGRICULTURE DURING THE IX PLAN PERIOD

In the preceding section additional employment likely to be generated during the IX Plan has been estimated at 6.10 million person-years in ON-FARM and OFF-FARM activities (1665 million person-days); that is, about 1.22 million person-years or 333 million person-days in a year. This is over and above the additional employment of rural labour in agriculture supported by Major & Medium Irrigation projects in about 31.0 M ha that is likely to be irrigated by the end of VIII Plan. With 85 person-days per ha of additional employment, this works out to 2635 million person-days per year, that is 9.65 million person-years per year or 48.25 million person-years during IX Plan period.

11.8 TRAINING REQUIREMENTS IN THE IX PLAN

National Water Policy adopted in 1987 recommends the importance of training of personnel engaged in the water resources sector. A perspective planning for standardised training has been considered essential as an integrated part of water resources development in the policy document. The training would cover information systems, sectoral planning, project planning and formulation, project management, operation and their fiscal structures and systems and the management of the water distribution systems. The policy document has also stressed that the training would extend to all the categories of personnel involved in these activities.

In view of the importance stressed for training and in view of the fact that the sector is highly interdisciplinary in nature with rapid technological

developments occurring in this sector, it is considered necessary that atleast 3% of the time of the technical personnel are spent in the training by each category of staff, engineers, sub-professionals etc. So as to provide the requisite continuing education.

Training facilities are to be provided to mostly engineers and other technicals. As per details given in Tables-11.4 & 11.5, additional employment of engineers and other technicals in construction & OMR activities is 1,39,900 person-years of engineers and 2,10,727 person-years of other technicals. Hence, arrangement for providing training to 2,18,244 person-weeks for engineers and 3,28,734 person-weeks for other technicals is to be provided by various training institutes, educational institutes and other institutes where facilities for providing specialised training in selected fields are available.

Training of irrigation agency staff is very much required for participatory irrigation management. The orientation and attitude of staff needs to be changed from construction and engineering to management of water resources projects. The attitude of considering themselves as provider needs to be changed and they should be prepared to accept users as their equal partners in the management of irrigation system.

The staff deployed for monitoring and evaluation of projects and those involved in construction, needs to be trained in scientific and modern techniques of management monitoring and evaluation.

The survey and investigation staff needs to be trained in use of latest equipments and instruments, and training in use of computers need to be provided to all officers.

Fields of training have been identified and listed in Annexure-11.3. This list will need updating and upgrading from time to time to respond to the needs of the hour in fast changing scenario in the field of water resources development and management.

11.8.1 Measures for meeting the additional requirement of Training facilities during IX Plan.

Following measures are suggested for meeting the requirement of training facilities during IX Plan.

- a) Water and Land Management Institutes and Irrigation Research Institutes should expand their training programme. CBI&P should plan and implement training in selected fields through Irrigation Research Institutes.
- b) There are a number of Agricultural Economics Research Centres in the country through which training should be organised. Institute of Economic Growth, Delhi (IEG) and Indian Institute of Public Administration (IIPA) also could be approached for expanding training facilities in the field of economic appraisal/ investment planning etc.
- c) In order to make the training programme more effective and useful, some of the training programmes should be organised in the States or regions rather than at in the headquarters of CWC, CBI&PO, IEG, IIPA, CTU(Pune), and other institutions imparting specialised training in selected fields.
- d) Four to six regional centres should be gradually developed in the country at which specialised training of World-class could be imparted in selected fields.
- e) It is time now to prepare standard training lectures on videotapes which could be utilised at larger number of stations in the country, economically and conveniently.
- f) Induction/ Orientation courses at entry stage and Refresher courses at two stages with 10-15 years interval should be made compulsory; and for achieving this, it would be useful to associate some of the educational institutions like IITs, Engineering Colleges and ITIs etc.
- g) Training courses should include case-studies to be done by the trainers and trainees; it would necessarily include field visits and hands-on experience.

- h) Other technical and sub-professionals like Gauge recorders, both rain gauge and river gauge; operation of reservoirs, diversion weirs and canal structures (out-let operators, patrols and amins, etc.) deserve greater attention than that being given so far.
- i) The goal of training should be to enrich the knowledge, develop the skill of the trainees and to motivate them to give their best in the area of their operation.

ANNEXURE-11.1**Statement showing yearwise Utilisation of Potential created**

Plan Year	Potential Created during the year (M Ha)	Cumulative potential created during the Plan (M Ha)	Utilisation of Potential created		
			During the VIII Plan (M.Ha.)	During the IX Plan (M.Ha.)	Total (4)+(5) (M.Ha.)
1	2	3	4	5	6
VIII Plan	0.600	0.600	0.060	-	-
1992-1993	0.600	1.200	0.180	-	-
1993-1994	0.600	1.800	0.420	-	-
1994-1995	0.600	2.400	0.780	-	-
1995-1996	0.608	3.080	1.260	-	-
1996-1997					
Sub Total	3.080	3.080	2.700		
IX Plan	1.500	1.500	1.800	0.150	1.950
1997-1998	1.500	3.000	2.280	0.450	2.730
1998-1999	1.500	4.500	2.640	1.050	3.690
1999-2000	1.500	6.000	2.880	1.950	4.830
2000-2001	1.500	7.500	3.080	3.150	6.230
2001-2002					
Sub Total	7.500	7.500	12.680	6.750	19.430
X Plan	Not being considered	Not being considered	-	4.650	-
2002-2003			-	5.700	-
2003-2004			-	6.600	-
2004-2005			-	7.200	-
2005-2006			-	7.500	-
2006-2007					
Sub Total				31.650	

ANNEXURE-11.2

Estimation of Indirect Employment Generation Through Major & Medium Projects during IX Plan period.

Year during IX Plan	Area to be Irrigated (M Ha)	Farm Sector		Livestock Sector		Non-Farm Sector		Total	
		Million Pds	Million SPYs	Million Pds	Million SPY	Million Pds	Million SPY	Million Pds	Million SPY
1	2	3	4	5	6	7	8	9	10
1997-1998	1.95	37.50	0.36	19.50	0.07	48.75	0.18	165.75	0.61
1998-1999	2.73	136.50	0.50	27.30	0.10	68.25	0.25	232.05	0.85
1999-2000	3.69	184.50	0.68	36.90	0.14	92.25	0.34	313.65	1.16
2000-2001	4.83	241.50	0.88	48.30	0.18	120.75	0.44	410.55	1.50
2001-2002	6.23	311.50	1.14	62.30	0.23	155.75	0.57	529.55	1.94
Total	19.43	971.50	3.56	194.30	0.72	485.75	1.78	1651.55	6.06

Note:

- Figures in Col. 2 are annual irrigation as in Annexure-11.1.
- Additional employment generations in Farm Sector, Livestock Sector & Non-Farm Sector are 50, 10 and 25 Pds per hectare of irrigated farming respectively.
- Pds = Person-days, SPY = Standard Person Year (273 Pds)

FIELDS OF TRAINING

A. Advance Planning and Project Formulation:

- River Basin Planning
- Hydrology for Project preparation
- Crop Water Resourcement in different Agro-climatic Zones & Sub-zones
- Environmental Impact Assessment Studies
- Survey, Planning & Layout and Design of Distribution System
- On Farm Development (OFD)
- Micro Canal Network Planning and Design of Micro Structures
- Planning, Designing & Layout of On Farm Development (OFD)
- Conjunctive Use of Surface & Project Appraisal
- Economic Analysis of Irrigation & Multi purpose Water resources projects
- Use of modern techniques & technologies in survey, investigation and project formulation

B. Construction:

- Rehabilitation and Resettlement
- Construction Planning- Use of PERT/CPM techniques
- Construction Management and monitoring
- Quality control and instrumentation
- canal Design and Distribution System
- Design and construction of Dams, barrages and other major structures using state-of-art
- Phase-construction and stage construction

C. Operation, Maintenance & Repair (OMR)

- Farmers awareness in integrated agriculture
- Structured Irrigation including monitoring & evaluation as well as Agricultural Intensification
- Orientation workshop for involving NGOs for formation of WUAs
- Water Use & Crop Production Technology
- Farmers Organisation & Turnover (FOT)
- Flood Management
- Operation & Maintenance of Irrigation Systems
- Development of Crop Scheduling & Operational Plans
- Operation and Maintenance of Irrigation structures.
- Computer applications in irrigation system management
- Irrigation management in ID and Wet crops Irrigation scheduling
- Participatory Irrigation management (PIM) etc.
- Computer Application in Irrigation Water Management
- Formation of Water Users Association (WUAs)
- Canal Operation
- Soil and Water conservation

C. Monitoring and Evaluation:

- Monitoring of Irrigation Projects
- Pricing of Irrigation Water
- Financial management in Water Resources Projects
- Environmental Impact of WR Projects

- **Performance Evaluation of Irrigation Projects**
- **Computer Application in MIS**

D. General:

- **Induction Courses/Orientation Courses for newly appointed ABs/JBs**
 - **Training course for Field Level Staff**
 - **Environmental Engineering**
 - **Water and Land Management**
 - **Pressurized irrigation system like sprinkler and drip**
 - **Computer General Awareness**
 - **Computer Application in MIS**
 - **Induction Training Programme**
- a) **Data Transmission**
 - b) **Remote Sensing**
 - c) **Canal Automation**
 - d) **Drainage Engineering**
- **Course for Women Farmers**
 - **Progressive Farmers Irrigation Course**
 - **Acts & Rules relating to irrigation.**

CHAPTER-XII

SCIENCE AND TECHNOLOGY PLAN FOR THE IRRIGATION SECTOR SO AS TO EVOLVE A SUITABLE SST PROGRAMME

12.0 INTRODUCTION

Water Resources Sector is a key socio-economic sector involving huge investments. Systematic Research & Development (R&D) programmes are to be evolved and continuously pursued in order to provide major S&T inputs in various facets of Water Resources Development in consonance with the targets and directives of National Water Policy. Such targets can only be achieved with the twin efforts of new breakthroughs in R&D and proper dissemination of the research outputs. In this background, planning for S&T through proper R&D activities needs to be given top priority.

12.1 Mechanism to handle R&D Network in WR Sector

The need to provide for proper mechanism and adequate network for effectively performing the functions of identifying thrust areas, prioritizing short term and long term action profiles of the R&D activities gave impetus in forming Scientific Advisory Committee (SAC-WR) which later was reconstituted as Science & technology Advisory Committee (STAC- MOWR). Since 1988, seven meetings of STAC-MOWR have so far been held and atleast two meetings a year are proposed to be held in future in order to set a dynamic programme for future course of action and to effect corrective measures from time to time.

Ministry of Water Resources (MOWR) through various Indian National Committees as well as other premier institutions such as CWC, CWPRS, CGWB, etc. supports research and development projects/programmes in various disciplines pertaining to water resources development in the country, by providing suitable grant-in-aid.

Various R&D schemes/proposals/projects for which grants-in-aid from MOWR are given covers one or combinations of categories such as ,:

- (i) Basic Research
- (ii) Applied Research
- (iii) Action Research
- (iv) Education & Training
- (v) Mass Awareness on Water Resources Development
- (vi) Infrastructural Development and
- (vii) Creation of Centres of Excellence

These activities are carried out presently by different Indian National Committees such as INCCMS, INCH, INCOH, INCID and INCRMTT and organisations like CGWB, CWC and NIH.

OUTLAY OF VIII PLAN ON R&D OF WRD SECTOR

The outlay for the VIII Plan period for WRD Sector is:

TABLE 1: Total outlay on R&D (itemwise)

	(Rs. in lakhs)
i) For basic & applied research schemes on subjects assigned to, INCs	1,156
ii) For research schemes not covered by INCs but suggested by CWC, CGWB, GFCC, MOWR, etc.	399
iii) For infrastructural Development	700
iv) For Education & Training	430
v) Centres of Excellence	1,445
vi) Action Research	570

	4700

TABLE 2: OUTLAY ON R&D (Institutionwise)

	(Rs. in lakhs)
1. Central Water Commission	530
2. CWPRS (INCH)	1200
3. CSMRS (INCRMTT & INCCMS)	500
4. NIH (INCOH)	575
5. CAD/MOWR (INCID)	1220
6. CGWB (Minor Irrigation)	125
7. GFCC	100
8. MOWR	450

	4700

12.3.1 Financial Progress under Eighth Plan

The actual yearwise expenditure upto 31.3.1995 handled by different Indian National Committees, besides CWC are as follows:

<u>Committee</u>	<u>Actual Expenditure</u> (Rs. in lakhs)		
	<u>1992-93</u>	<u>1993-94</u>	<u>1994-95</u>
INCH	58.55	4.44	35.177
INCID	26.342	38.221	71.027
INCRMTT	46.80	----	44.473
INCCMS	-----	7.20	13.959
INCOH	58.00	7.628	37.366
* CWC	3.00	9.32	38.119
TOTAL	----- 192.692	----- 66.809	----- 240.121

* CWC's utilisation of R&D expenditure is in Mass Awareness and Education & Training programmes.

As for achievement of the Indian National Committees, the cost of the schemes sanctioned in the first three years of the VIII Five Year Plan (1992-1995) are as follows:

	<u>Total Cost</u>	<u>Funds released so far</u>
INCH	378.76	140.86
INCID	222.23	109.13
INCRMTT	213.18	103.84
INCCMS	79.36	37.34
INCOH	186.83	90.81
	-----	-----
TOTAL	1080.36	581.98
	-----	-----

* Excluding expenses on secretariat (around Rs.42.84 lakhs)

Schemes under Irrigation & Drainage

Under Irrigation Sector, several R&D schemes have been executed by MOWR through Indian National Committee on Irrigation & Drainage (INCID). For this, six thrust areas were identified for prioritization in the Eighth Five Year Plan as given below. More than 50 schemes have been undertaken during the Plan period so far.

1. Development of Technology for containment of adverse environment impacts of dams and reservoirs including sedimentation control for different geomorphic, vegetation and rainfall regions of the country.
2. Establishment of more effective evaporation control methodologies.
3. Development of package of cost effective technologies for erosion control, non-structural measures for flood control, disaster preparedness.
4. Field trials for controlling 'Water Logging and Salinity.'
5. Development of cost effective canal linings including new materials and techniques.
6. Efficient water management techniques including better farm application methods of drip/sprinkler system and Dynamic regulation of canal networks.

Though the thrust areas of INCID has been highlighted above, in as much as the activities of this committee directly affects irrigation sector, the works of the other committees which also takes care of additional thrust areas are

also of significance for water resources sectoral development. The ten major thrust areas of R&D prioritised by STAC-MOWR which governed the 8th Plan activities are detailed as under:

1. Development of adequate standardised network of hydrologic, hydraulic, seismic and structural instrumentation for river valley projects. INCH
2. Development of Technology for containment of adverse environment impacts of dams and reservoirs including sedimentation control for different geo-morphic, vegetation and rainfall regions of the country. INCID
3. Establishment of more effective evaporation control methodologies. INCID
4. Development of optimised drilling-blasting support technology for underground excavations alongwith use of modern tunnel boring machines. INCRMTT
5. Development of package of cost effective technologies for erosion control, non-structural measures for flood control, disaster preparedness. INCID
6. Field trials for controlling 'Water Logging and Salinity.' INCID
7. Development of cost effective canal linings including new materials and techniques. INCID
8. Efficient water management techniques including better farm application methods of drip/sprinkler system and Dynamic regulation of canal networks. INCID
9. Present concrete technology and new construction materials and techniques. INCCMS
10. Regionwise re-estimation of Ground Water Potential including techniques for Ground Water recharge, protection from pollution and cost effective ground water Development. INCOH

Proposal for Ninth Plan :

Looking back to the achievements under VIII Plan as given in para 3.1, it is observed that the extent of utilisation has not reached the ambitious levels projected in the Plan. So a pragmatic evaluation of future performance under Ninth Plan has to keep in view the goal targetted during the Eighth Plan which could not fully be accomplished to the envisaged extent. The prioritized thrust areas spelt out for the Eighth Plan are still valid and by and large, applicable for the Ninth Plan also. However some changes in the sub-areas and allocation of such areas to organisations like CWC, CGWB could be envisaged for the future. Unlike the Eighth Plan period, when it was hampered by a switch-over from CBI&P to INCs for handling R&D schemes with the consequent delays in this switch-over effort, the streamlining of the efforts and monitoring of STAC-MOWR of the activities having taken place the Ninth Plan proposals could be accomplished in a better manner. Accordingly the projection of requirements has been done in what follows:

(Rs. in lakhs)

i) For basic & applied research schemes on subjects assigned to INCs		1,300
ii) For research schemes not covered by INCs but suggested by CWC, CGWB, GFCC, MOWR, etc.		400
iii) For infrastructural Development		800
iv) For Education & Training		500
v) Mass Awareness Programme		500
vi) Centres of Excellence		800
vii) Action Research		700

		5000

CHAPTER XIII

TO EXAMINE THE FOLLOW UP ACTION TAKEN ON THE
RECOMMENDATIONS OF THE PUBLIC ACCOUNTS COMMITTEE
MADE IN REPORT (TENTH LOK SABHA) AND RECOMMENDED
SUCH CHANGES IN CONTEXT OF THE IRRIGATION DEVELOP-
MENT PROGRAMME FOR THE NINTH FIVE YEAR PLAN.

13.1. Introduction :

Brahmaputra Board was constituted in 1981 under the Ministry of Water Resources to prepare the Master Plan for control of flood, bank erosion and improvement of drainage in the Brahmaputra-Barak basins. The objectives of the Board also included preparation of detailed reports and estimates in respect of Projects proposed in the Master Plan. The expenditure on the Board is budgetted on the basis of grant-in-aid from Ministry of Water Resources.

The Public Accounts Committee (PAC) (1992-93) in their Report No. 49 on "Brahmaputra Board, Guwahati-Idle Outlay" based on Audit para 49 of the report of the Controller and Auditor General of India for the year ending March, 1991, made some observations regarding delay on the part of the Board in preparation of the Master Plans, time and cost over runs, in adequate utilisation of the equipments etc. Report on action taken on the observations were furnished by the Ministry of Water Resources. The PAC (1994-95) subsequently considered the action taken by the Ministry of Water Resources on the 49th Report of the PAC and gave their recommendations and observations in report No. 74. Both the reports of the PAC have been presented to the 10th Lok Sabha.

The observations of the PAC and the action taken thereon as furnished by the Brahmaputra Board are given in the following paragraphs :

13-2. 49th Report of PAC :

Sl. 1 Para 70

In the absence of effectively harnessing the huge water resources of the north-eastern region, this region has perpetually been beset with acute and complex problems of floods, bank erosion and drainage congestion. With a view to overcome the havoc created by these uncontrolled water resources and to utilise them for irrigation, hydro-power navigation and other beneficial purposes, the Government of India constituted the Brahmaputra Board on 31st December, 1981 to carry out surveys and investigation in the Brahmaputra valley (including Barak valley) and prepare a Master Plan for control of floods and bank erosion and improvement of drainage in this valley. The Board was also to prepare detailed reports and estimates in respect of dams and other projects proposed in the Master Plan, as approved by the Central Government and to undertake the construction and maintenance of the approved projects. Due to enormity of the task, the work of preparation of Master Plan was divided into three parts : Part-I dealing with the main stem of the Brahmaputra river; Part-II dealing with the Barak river and its tributaries; Part-III dealing with the tributaries of the Brahmaputra and the rivers of Tripura. The targeted dates of preparation of these three parts of the Master Plan were December 1986; March 1988; and March, 1990 respectively. While Parts I and II of the Master Plan were prepared and submitted to the Ministry of Water Resources and concerned State Govt. etc., almost within the target dates, the Committee are unhappy to find that the preparation of Part III of the Master Plan is yet to be completed even after a lapse of three years from the target date in March 1990. What is more disquieting is the fact that even the updating of the Parts I & II of the Master Plan submitted as early as in December, 1986 and March, 1988 respectively on the basis of comments received from various quarters still remains to be achieved. The Committee are unhappy over the abnormally long time taken in the completion of the different parts of the Master Plan. Keeping in view the enormous benefits envisaged to the entire region in the implementation of the Master Plan, the Committee emphasize that concerted efforts should be made by all concerned to urgently complete the remaining activities on all the three parts of the Master Plan so that the eventual clearance by the Ministry is considered.

ACTION TAKEN [Sl. (1) - Para 70]

"Updating of the Master Plan Part I (dealing with the main stem of Brahmaputra river) is in progress. As the flood management measures of the main stem is closely interlinked with those of its tributaries covered under the Master Plan Part-III (dealing with 38 tributaries of Brahmaputra and 8 rivers of Tripura) it is essential to integrate both the Master Plans. The job of integrating the flood management measures could be taken up in right earnest from 1993 after completion of Master Plan of the tributaries and is targeted for completion by March, 1996.

Updating of the Master Plan Part II (dealing with the river Barak & its tributaries) is scheduled for completion by Oct, 94.

Updating of Master Plan Part III based on the comments received from the concerned State Governments and Departments of Central Government, is being carried out alongwith Master Plan Part I and is scheduled to be completed by March, 1996."

Sl. 2 Para 71

The total estimated expenditure on the execution of the three parts of the Master Plan is of the order of Rs. 55,333 crores, and the break up of this expenditure for parts I, II and III is Rs. 32,085 crores (1983 price level), Rs. 2,500 crores (1988 price level) and Rs. 20,748 crores (1992 price level). Obviously, these estimates will further escalate if these are recalculated at the current prices. According to the Ministry of Water Resources the updating of Parts I and II of the Master Plan would be completed by March 1994 and March 1993 respectively. Further the work on the completion of Part III of the Master Plan would be completed by March, 1993 and overall investigation of Part I and those of the tributaries of the Brahmaputra would be completed by March, 1995. The quantum of the achievements made thus far in the finalisation of the different parts of the Master Plan clearly reveals lack of urgency and seriousness on the part of the concerned authorities. The Committee emphasize that serious efforts should now be made to complete the pending activities of formulating the Master Plan in accordance with the aforesaid forecasts. In view of the enormous financial requirements for the execution of the Master Plan, a comprehensive scheme should be chalked out by the Ministry of Water Resources in consultation with the other concerned authorities for a phase-wise execution of the Master Plan. It is understood that part of the financial requirements are proposed to be met by taking assistance from the Global investment Fund. The Committee urge that all necessary steps to tie up this assistance should be taken well in advance. Meanwhile, efforts should be continued to be made to resolve the objections raised by various State Governments expeditiously so that there is no slippage on this account. The Committee would like to know the details in this regard.

ACTION TAKEN [Sl. (2) - Para 71]

"Brahmaputra Board have intensified its efforts to complete updating the Master Plans in accordance with the schedule and the same has been incorporated in the annual action plan of the Board for the year 1994-95.

Execution of the Master Plans is the responsibility of the concerned State Governments having territorial jurisdiction over the Brahmaputra and Barak Valleys. Financial allocations have been made to individual States by the Planning Commission under Flood Control for flood management within their respective territories and the State Governments have been advised to implement the Master Plans by fixing priorities and in accordance with the availability of funds at their disposal.

Eight major storage projects are under investigation by the Brahmaputra Board. These are mega projects and would need substantial investments. As a starting point; one of the three projects viz. the Tiparmukh Multipurpose Project in the Barak Valley was posed for financial assistance to the Global Infrastructure Fund (GIF) at Japan. Ministry of Water Resources has been pursuing the States of Assam, Manipur and Mizoram to permit Brahmaputra Board to complete investigations for rehabilitation works on account of submergence due to construction of the Tiparmukh dam. Recently some positive indications from the Government of Manipur have been received.

Ministry of Water Resources has been pursuing with the government of Arunachal Pradesh seeking their concurrence for Brahmaputra Board to undertake investigations concerning environmental impact assessment for Dibang and Subansiri Multipurpose Projects and complete their detailed project report. The projects in parts or as a whole can be posed for funding only after detailed project reports and Master Plans have been formulated.

Sl. 3 Para 72

The Committee note that an expenditure of about Rs. 64.77 crores has been incurred upto March, 1992 for the various activities undertaken by the Brahmaputra Board since its coming into being in 1981. The Committee are unhappy to find that the results achieved are far from satisfactory. For instance, Part III of the Master Plan which was to be completed by March, 1990 is yet to be completed. The Board has not undertaken the execution of any of the flood protection works so far identified in the Master Plan. In spite of the fact that there is no progress in the execution of Dihang Dam Project and Subansiri Dam Project, project reports for which were submitted to the Govt. in July, 1983, the Board has incurred an expenditure of Rs. 11.99 crores upto March, 1992 for the collection of Hydrometrological data for updating the data incorporated in the project reports, submitted in July, 1983. The Board had also taken up the preparation investigation, data collection of 30 identified drainage schemes, out of which it has been able to submit project

reports in respect of 7 schemes only so far. The Board has taken up as of data the execution of only one scheme viz., the setting up of the North Eastern Hydraulic and Allied Research Institute. The Committee are distressed to find both time and cost over-runs in the execution of this scheme. The Institute originally slated to be completed by March, 1993 is now scheduled for completion in April, 1994, resulting in cost escalations to the tune of Rs. 26.24 lakhs. The Committee find that delays in implementation have resulted in infructuous expenditure on updating data and avoidable cost and time overruns. The Committee take a serious view of all these aberrations on the part of Brahmaputra Board and urge the Ministry to look into the matter and initiate necessary steps immediately to improve the working of the Board eliminating the possibility of incurring any further avoidable expenditure.

ACTION TAKEN [Sl. (3) - Para 72]

"Field investigations for Part III of the Master Plan (36 tributaries of Brahmaputra river and 8 rivers of Tripura) have been completed and the reports circulated to the concerned agencies of Centre and the States for their comments in the year 1993. These agencies are being pursued by the Brahmaputra Board for suggestions and comments to be incorporated in finalising the Master Plan. Special emphasis has been laid towards activities related to this Master Plan in the 1994-95 annual plan to speed up its completion.

The Master Plans prepared by the Brahmaputra Board and circulated to the States are meant for guiding the States in executing flood management projects by them. The responsibility for execution of flood management works lies with the State Governments in accordance with priorities within the limitations of the available funds.

The Detailed Project Report (DPR) for Dihang and Subansiri Projects could not be completed for want of clearance from the Government of Arunachal Pradesh to permit Brahmaputra Board for carrying out investigations to prepare a comprehensive rehabilitation plan and environmental impact assessment for these projects. Ministry of Water Resources had taken up this matter with the Chief Minister of Arunachal Pradesh to convince the utility and allay their fears and concerns about those two projects. Further efforts are proposed to be made to get their concurrence. The expenditure incurred after July, 1983 on the collection of hydrometrological data is justifiable for updating the data base. This helps in preparation of more realistic Project Reports.

The Board has completed formulation of 10 drainage schemes till March, 1993 out of a total number of 30 identified schemes. The remaining schemes are being taken up for finalisation.

The delay in execution of the North Eastern Hydraulic and Allied Research Institute, Rudreswar, North Guwahati were due to unforeseen reasons. Factors such as the inability of the first

contractor to complete the approach road, necessitating the award of work to another contractor, and delay in grant of forest permit by the Forest Department for undertaking site preparation for the Institute contributed to delay in commencing the constructive work of the model trays. After obtaining forest clearance, the construction work was speeded up and the Board has completed the model tray for operation in March, 1993.

Action taken by the Ministry of Water Resources and the Brahmaputra Board on various issues as mentioned above have resulted in improving the working of the Board and would reduce the expenditure to minimum"

Sl. 4 Para 73

The areas of the proposed Dihang and Subansiri Dam Project are situated in seismically active region. With a view to conducting micro earthquake studies in the vicinity of these projects, the high level Committee for utilisation of water resources of the Brahmaputra, in its meeting held in February, 1980 decided that micro earthquake recorders should be installed in the areas surrounding both dam sites. The Committee, however, find that the protracted procedure followed by the various agencies and Departments of Government of India took more than 4 years to finalise the details for the equipment in question and consequently the supply order for import of 8 units of DR-200 digital type MEQ recording system could be finally placed by the Brahmaputra Board on a foreign firm through their Indian agent only in November-1984. The Committee are not convinced by the arguments adduced by the Secretary, Ministry of Water Resources that "lot of processing is involved when the instruments required are of special variety and special type and if there is foreign import", as the facts narrated in the succeeding paragraphs clearly reveal that despite unduly long time taken by various agencies in finalising the relevant details there was not only failure in stipulating proper terms and conditions in the contract for ensuring operational efficiency of the sophisticated instruments but also lack of serious approach on the part of the Brahmaputra Board to effectively safeguard their financial interests.

Sl. 5 Para 74

All the 8 imported sets of recorders costing Rs. 23.65 lakhs, were received in August, 1985. The Committee are surprised to find that in spite of the fact that warranty for these sets was only for one year, the joint inspection of the sets was not conducted immediately on receipt and was only conducted in January, 1986, when one set was found defective. The sets were installed in January, 1986. It is unfortunate to note that all the seven sets became defective and inoperative one after another. The dates of occurrence of defects in these sets were May, 1986, September, 1986, November, 1986 and January, 1988 (Four sets). The Committee are deeply concerned to find that the Brahmaputra Board sent the defective sets to the Indian agent of the firm at Bombay only in December, 1991 after an inordinate

delay. These sets were eventually repaired between June, 1992 and January, 1993 at an additional cost of about Re. six lakhs.

Sl. 6 Para 75

The Committee are distressed to find that there was an unconscionable delay of about five years on the part of the Brahmaputra Board in getting the defective instruments repaired. They are not convinced by the arguments advanced by the Ministry that the details of the defects in the equipments had to be ascertained and pin-pointed by the expert agency and that the location of installation sites in the interior places of Assam and Arunachal Pradesh delayed the whole process. The other plea advanced by the Ministry that due to the decision to go slow on Dihang and Subansiri Projects, the Brahmaputra Board went slow on repairs of defective sets is also not tenable as the Brahmaputra Board had stated in October, 1990 in reply to the audit observation that the field study had to be completed by other instruments and that the defective sets after repairs would be utilised in some other projects. The Committee are convinced that there was gross negligence on the part of concerned authorities in pursuing the matter with the agent for getting all the defective sets repaired in time with the result that two imported sets could not be utilised at all and even the other six sets were very inadequately utilised as they remained operational only for a period ranging from 86 days to 218 days right from their installation in January, 1986. This clearly shows that the entire expenditure of about Rs. 30.00 lakhs incurred on the procurement of these eight sets proved to be totally infructuous in the view of the Committee. The Committee recommend that an enquiry should be instituted with a view to fixing responsibility for the unduly long delay on the part of the concerned authorities to take timely steps for getting the defective sets repaired. The Committee would like to stress again the environmental importance of the project and emphasise that no slippages would be allowed to hamper the progress of the project. The Committee would therefore, like to know the outcome of this enquiry within a period of three months and further action taken thereon.

ACTION TAKEN [Sl. Nos. (4) to (6) - Para 73 to 75]

"Based on the recommendation of the Public Accounts Committee to institute an enquiry for fixing responsibility for the delay in getting the micro earthquake sets repaired, Ministry of Water Resources constituted a one man enquiry committee comprising Dr. P.P. Vaidyaraman, Director Central Water and Power Research Station, Wadakwasla, Pune to examine all the issues appearing in paras 73, 74 and 75 of this PAC report, to make recommendations for improving the situation and also to fix responsibility for the delay in getting the micro earthquake sets repaired.

The enquiry officer has opined that due to the involvement of a number of agencies/departments as also the cumbersome and time-consuming procedure for obtaining clearance for procurement

of the instruments and release of foreign exchange, it took one year and two months from the time for request for release of foreign exchange to the time for placing purchase order. In regard to the terms and conditions contained in the supply order to the company in USA, the enquiry officer has opined them to be generally in order as a clause was included for replacement of defective units during warranty according to normal practice. It would have been desirable to have a provision for training of local staff in the erection, maintenance and operation of the equipment as well as the responsibility of repairing the equipment at site to the manufacturer's agent in India when warranted. In future, this clause would be incorporated in the supply order for all sophisticated imported equipments to avoid operational and repair problems.

The recorders had collected data at site for periods varying between 2-6 months each on an average. These data are spread over a sufficiently long period so as to be useful for pre-impounding seismic evaluation of the sites. The import of these units therefore has served its purpose to that extent so far.

On the issue of delay in getting the units repaired, the enquiry officer has opined that the multiplicity of organisations involved, the prevailing system of obtaining clearance for procurement of spares from overseas, the sophistication and delicateness of the equipment, difficult site conditions and the non-availability of trained personnel with the Brahmaputra Board had all contributed to the delay in getting the micro-earthquake units repaired. Considering these factors, the enquiry officer has stated that it is not possible to specifically pin-point any particular individual responsible for the delay.

Suggestions made by the enquiry officer concerning the terms of supply order, training of the engineers for basic operation and maintenance and the handling of such issues by a designated individual senior officer of the Brahmaputra Board have been accepted for future course of action."

The Committee take a serious view of the omissions and do not find any justification for the inadequacies in the terms and conditions of the contract and the failure to take note of the topographical conditions of the area and availability of personnel with the Board etc. while going in for procurement of such costly and sophisticated equipments. They, therefore, desire that the Ministry of Water Resources should look into the matter and take appropriate remedial/corrective measures so as to obviate recurrence of such cases in future.

13.3 Observations of Public Accounts Committee on the action taken [Sl. (1) to (2) - Para 70 to 71]

The Committee regret to note from the Action Taken Note that in further revision of the schedule given to them earlier, the target dates for completion/updating of the different parts of the Master Plan have again been extended. As per latest schedule, while updating of the Part-I & III will be completed

by March, 1996 only report on Part II of the Master Plan is still under preparation after completion of the investigations. Considering the fact that the initial targets for completion of Parts I to III were fixed as far back as for December, 1996, March, 1988 and March, 1990 respectively, the Committee regret that the Ministry of Water Resources have not been successful in ensuring finalisation of the Master Plan with the desired degree of urgency and seriousness. Since the implementation of the projects included in the envisaged Plan are expected to create a profound impact on the development of the entire region, the Committee would urge the Ministry to ensure that earnest efforts are made by all concerned to complete the remaining activities of all the three parts of the Master Plan so that its eventual clearance by the Ministry is considered expeditiously. The Committee would like to be apprised of the progress made.

13.4 Public Accounts Committee

Further developments on the observations of Public Accounts Committee, on the basis of the information received from Brahmaputra Board, Guwahati are as under :

13.4.1 Delay in completion of Master Plan [Sl. 1 and 2, Para 70-71]

The basic idea of preparing a Master Plan is to identify various potential schemes for the implementation so that the executing agency may take up construction of a scheme identified in the Master Plan of the basin. This process is a dynamic one and may not be termed as final since there is always scope of improving/ updating the components of the Master Plan at different stages of time depending upon the priorities assigned, the financial resources, the technology available, resolving of inter-State aspects, approval of the Ministry of Environment and Forest and other Ministries concerned etc. So far as the Master Plan of the Brahmaputra river, the Barak river and 8 Nos. of rivers of Tripura which are within the jurisdiction of the Brahmaputra Board is concerned, the above requirements have been made with to a great extent. Though the Master Plans are not approved, due to some observations/comments from certain agencies concerned, it may not be concluded that the purpose for which Master Plans is prepared has not achieved. The observations/ comments of various organisations is a continuous process. The Brahmaputra Board in its 22nd. Meeting held on 15th February, 1995 approved the Master Plan Part-I dealing with the Brahmaputra main stem and Master Plan Part-II dealing with the river Barak and its tributaries. However, further improvement/ updating of the Master Plan will be a continuous process. So far the Master Plan Part-III dealing with the 38 tributaries of the Brahmaputra and 8 rivers of Tripura is concerned, all the Master Plans have been submitted to the Ministry of Water Resources and other concerned organisations and modifications with due compliance of the comments/ observations offered by the concerned is in progress. In this connection it is to be mentioned that Master Plan of the tributaries, viz. Buri-dehing, a tributary of the Brahmaputra and the Gumti, a river of Tripura have been approved by the Brahmaputra Board in its 19th. Meeting held on 11.11.93.

The printed copy of the Buri-dehing Master Plan has already been forwarded to the Ministry for further necessary action vide Board's letter No. BB(W&B)MP-111/3/93/96 dated 20.01.95 endorsing copies to all concerned.

Action has initiated to comply with the comments of the various organisations for putting up to the Board for approval. However, as mentioned above, it is a continuous process. It is programmed to bring out printed copies of the Master Plan of the Barak (Part-II) during July, 1995 and that of Brahmaputra main stem (Part-I) during December, 1995. Concerning Master Plan Part-III, it is programmed to modify 14 Nos. of tributary Master Plans and put up to the Board for approval during 1995-96 and the remaining 30 Nos. during 1996-97. With this almost all the works relating to Master Plan will be completed.

[Sl. (3) - Para 72]

While maintaining that the action taken by the Ministry on various issued had resulted in improving the working of the Board and in reducing the expenditure to the minimum, the Ministry of Water Resources have in their Action Taken reply stated that the expenditure incurred after July, 1993 on the collection of hydrometrological data for Dihang and Subansiri Projects was justifiable for updating the data base. According to the Ministry, the detailed project reports for Dihang and Subansiri Projects could not be completed for want of clearance from the Government of Arunachal Pradesh to permit Brahmaputra Board for carrying out investigations to prepare a comprehensive rehabilitation plan and environmental impact assessment for these projects. In this connection the Committee's attention has drawn to an analysis made by Audit on the expenditure of Rs. 691.00 lakhs and Rs. 865.48 lakhs incurred on Dihang and Subansiri Projects respectively during April, 1982 to March, 1990 completing investigations and preparing detailed project report.

An itemwise scrutiny of the details of expenditure of Rs. 501.04 lakhs out of Rs. 691.00 lakhs incurred for Dihang Project and Rs. 586.64 lakhs out of Rs. 865.48 lakhs incurred for Subansiri Project of which details were available indicated that only 20.73 percent and 24.37 percent of the expenditure of Rs. 501.04 lakhs and Rs. 586.64 incurred respectively by the Board on Dihang and Subansiri Projects were on collection of hydrometrological data and other survey works and the balance amounts were incurred on other items like land, miscellaneous, maintenance, building, tools and plant etc. Considering the fact that a substantial percentage of the expenditure had been incurred for non-survey purposes the Committee do not agree with the contention of the Ministry that the expenditure incurred since July 1983 was justifiable for updating the data base. In the opinion of the Committee, incurrence of expenditure of such a sizeable magnitude on reports of these projects which were facing adverse opinion from different quarters and where feasibility were awaiting clearance for over 10 years also do not seem to be a prudent exercise. These facts further reinforce the apprehensions of the Committee expressed in their earlier Report

regarding incurrence of sizeable expenditure by the Brahmaputra Board - with any satisfactory results. The Committee, therefore, desire that the Ministry of Water Resources should look into the matter and take necessary measures with a view to streamlining the working of the Board and eliminating the possibilities of avoidable and infructuous expenditure.

Expenditure incurred on investigation of the Dihang and the Subansiri Dam Projects :

[Sl. No. 3 - Para 72]

The proposed Dihang and Subansiri Dam Projects having installed capacity of 20,000 MW and 4800 MW respectively are two mega projects whose hydropower potential is of great national importance and flood moderation, irrigation and navigational aspects are expected to have a great impact on North Eastern Region. Accordingly, Government of India took keen and active interest for details survey and investigation for the above mentioned two projects.

For proper survey and investigation of such huge mega projects having national and regional importance; necessary infrastructure like roads, bridges, alongwith setting up of hydrological, meteorological, geological, earthquake monitoring units etc. were done. Detailed systematic and regular data collection, compilation and tabulation was of utmost importance for such a mega project. Moreover, annual maintenance of such infrastructure are also equally important and relevant.

Considering remoteness and difficult terrain of these two projects, it was absolutely necessary to establish such infrastructures near the project area so that all necessary survey and investigation are taken up and completed in a shortest possible time. This is done in all project investigations and is not done only for these projects.

Till yet no positive response from the Government of Arunachal Pradesh has been received inspite of the proposals of the Brahmaputra Board for constructing the Dihang and Subansiri projects for exploiting the available water resources for optimal utilisation in flood management, hydropower generation and other useful purposes. Efforts are being made by the Government of India and the Brahmaputra Board by initiating dialogue and discussions at various levels with the officials of the Government of Arunachal Pradesh.

13.5 RECOMMENDATIONS :

13.5.1 Timely completion of works.

The functions and responsibilities of an Organisation like Brahmaputra Board involve collection and assimilation of

voluminous basic data, including carrying out investigations, covering a number of basin states and concerned Central Govt. departments. Formulation of a realistic Work Programme and vigilant monitoring of the various check points should be used to ensure that the work progresses as per schedule. The active involvement and participation of the State Govts./departments should be a prerequisite for the purpose. The monitoring mechanism can be at different levels such as Ministry of Water Resources, Planning Commission, Brahmaputra Board, State Governments etc. Necessary measures to obviate bottlenecks in carrying out the work, if any, could be taken at appropriate time through such coordinated efforts.

13.5.2 EQUIPMENTS :

In order to ensure prompt after-sale service/maintenance, it would be preferable to use indigenous equipment manufactured and serviced by reputed firms. Import of equipment should be resorted to only in unavoidable and exceptional cases where the equipments is not available indigenously or it becomes binding under conditions of external funding agencies. In any case, repair and maintenance of the equipment should be the responsibility of the suppliers or their agents. Specific provision to this effect should be made in the Warranty/maintenance agreement with the Supplier. The performance of sophisticated/major equipments shall also be monitored continuously for ensuring optimum utilisation.

CHAPTER XIV

CREATION AND UTILISATION OF IRRIGATION POTENTIAL

14.1. There is a general feeling that the irrigation potential created is not utilised fully with the result that a lag between the figures of irrigation potential created and utilised always remains and it is increasing with each year of enhanced construction activity in irrigation sector. Incidentally such figures are also borne out from Government publications of relevant statistics.

14.2. It is therefore necessary that factual position is brought out and the methodology adopted for reporting figures of irrigation potential created and utilised is properly understood so as to allay the apprehensions with regards to under utilisation of irrigation potential created with huge investments during the plan period.

14.3. According to Planning Commission's letter of 1973.

- (a) The 'Irrigation Potential' created by a project at a given time during or after its construction is the aggregate gross area that can be irrigated annually by the quantity of water that could be made available by the connecting and completed works upto the end of water course or the last point in the water delivery system upto which Government is responsible for construction
- (b) The 'irrigation potential' utilised is the total gross area actually irrigated by a project during the year under construction.

14.4. It has however been experienced that the data furnished for potential utilised does not give a correct picture of utilisation of irrigation potential created. For example, in respect of major and medium irrigation projects, the gross area actually irrigated during the year by a particular scheme is termed as 'Potential Utilised' in the states of Andhra Pradesh, Haryana, Punjab and Tamil Nadu. But in the state of Uttar Pradesh, the maximum irrigation achieved by a project in any year is termed as its potential utilisation. In the case of Bihar similar definition is followed. In Gujarat the concept of hectare watering is followed for reporting utilisation. In Maharashtra utilisation is reported as the basis of Rabi equivalent area.

14.5. The area which can be irrigated need to be precisely assessed in view of the actual cropping pattern adopted by the farmers on ground and actual water availability during the year which depends on the rainfall in the catchment. Obviously these would be different from the figures arrived at the time of formulation of the irrigation scheme.

14.6. In Planning Commission's letter dated 10.10.79 regarding 'utilisation of irrigation potential -

construction and maintenance of water course and field channels' inter-alia, it was mentioned that

- " (a) There is great anxiety that the lag between the potential created and the potential utilisation thereof is reduced as much as possible and for this purpose an efficient distribution system right upto the farmer's field is considered to be absolutely essential. Government have been making considerable investments in developing distribution systems of irrigation projects upto the blocks of 100 acres (40 hectare) in size. Since it has not been possible to make much headway in construction of field channels at the farm level beyond the watercourses, it has been decided in consultation with the Ministry of Agriculture and Irrigation, Government of India, that it would be expedient to construct field channels as a part of the irrigation project itself upto at least a block of 5 to 8 hectares within the outlet command.
- (b) The above criteria should apply to on-going and new projects immediately. In case of the completed projects, the provision of field channels as a part of the project on the basis of the above criteria should be taken up as a part of the modernisation programme."

A number of projects have been completed by the end of 1979 with the earlier criteria of constructing water-courses upto 40 hectares block before the above directions were given. Considering the principle of Planning Commission's letter, the full potential thus was not created for such projects which had been completed before 1979, because field channels upto 5-8 hectare block were not constructed.

14.7. The various reasons for lag in utilisation of created potential are briefly indicated as under:

14.7.1 The irrigation projects are planned for giving a success of 75% dependability to irrigation supplies. Thus, it is inbuilt that for 25% of the period (in one hundred sequence) the water requirement of full irrigation potential will not be met and even if the design cropping patterns are followed there will be a lag in potential utilised irrespective of the extent of field channel. Thus the irrigation supplies themselves depend upon the river inflows which in turn are dependent on the rainfall, snow melting and other resources in the upper catchment area of the project. In a particular year when the rainfall is inadequate or scanty and snowfall or

snow-melting is inadequate, the river flows available for irrigation use would be less than normal and anticipated flows(as envisaged in the planning) would not be available for utilisation, consequently resulting in lesser irrigation in the particular year.

- 14.7.2 Delay in the construction of distribution networks, specially water courses, field channels and preparation of the command area for efficient use of irrigation water also acts as the bottleneck causing slower and lesser utilisation of irrigation potential created.
- 14.7.3. At times it happens that due to unforeseen circumstances, water supplies for domestic water supply and industrial requiremnts have to be made on priority basis from irrigation schemes and this causes curtailment in irrigation supplies and results in reduced irrigated areas.
- 14.7.4 Actual cropping pattern is different from cropping pattern adopted in the project report. As such comparison of utilisation, to irrigation potential as per sanctioned projects, is not realistic. As more water consuming crops are adopted in practice, specially in head reaches the command area in tail reaches are deprived of their due share of irrigation. Due to this the utilisation when reported against created potential is low and this shows lag in utilisation of created potential.
- 14.7.5. Also a lag of few years between the creation of irrigation potential and its full utilisation is unavoidable as the farmer has to be given reasonable time for switching over from the age old rainfed cultivation to irrigated agriculture which, inter-alia, has to be supported with agriculture extension services, availability of adequate and proper inputs (like fertilizers, seeds, labour etc.) and of course the availability of irrigation water as and when required by the crops. In many cases reclamation of new areas brought under irrigation take considerable time.
- 14.8. The Committee of Secretaries (COS) in its meeting held on 19.6.95 under the Chairmanship of Cabinet Secretary considered the Planning Commission's note of 'under-utilisation of irriation potential already created and its remedies.' One of the recommendations made by the COS in this regard was to reconcile the methodology for defining the performance indicators of irrigation system.
- 14.9. Planning Commission vide their recent note received vide D.O. No. 3 (16)/S/94-I&CAD dated January. 11, 1996 addressed to Secretary, MOWR have suggested for changing the reporting norm for irrigation potential from prevailing norm in terms of land area to the number of watering hectare.

14.9.1. Due to different practices being followed by various states in reporting the figures of utilisation it would seem appropriate to devise a uniform practice for assessing the utilisation. One of the methodology could be to switch over from the present 'area concept' to the 'amount of water' supplied. However without volumetric supply of water or measurement, it may be difficult to follow this in practice at present. It would be possible to do so when supplies are made on volumetric basis and adequate arrangements for measurement are made for the same.

14.9.2. The suggestion contained in the Planning Commission note to switch over to the norm of number of watering hectare could be referred to the 3rd Irrigation Commission recommended to be set up by the Working Group.

14.9.3. As would be seen from the above, there being number of variable in achieving the utilisation of the potential created, following points are placed for consideration of the concerned authorities:

1. The potential created indicate only the building up of infrastructure and facilities for providing irrigation supplies to the given area.
2. Utilisation of potential could be different due to several reasons and the Ministry of Agriculture and Cooperation, Department of Agriculture with its extensive field network may continue to collect and report the statistics of the utilisation of irrigation potential.
3. The Ministry of Agriculture should also monitor the cropping pattern actually adopted and water utilised by the farmers vis-a-vis the cropping pattern and water utilisation envisaged in the sanctioned project.
4. A lag of 3 to 5 years between potential created and potential utilised should be considered normal. Similarly, if 90% of the potential created is utilised it should be considered satisfactory.
5. Where the potential utilised is between 75% to 90%, of the potential created in a normal year even after a lag of 5 years the Ministry of Agriculture should find out if this is due to change in cropping pattern or due to deficiencies in project implementation/operation. Necessary remedial measures should be taken by the concerned department to remove the deficiencies.

6. In projects where the potential utilised is less than 75% of potential created even after a lag of 5 years during a normal year the concerned departments of the states should make a critical review of the causes of shortfall and suggest remedial measures. A malady remedy approach project by project will go a long way in more efficient utilisation of irrigation facilities created.
7. Any developmental mechanism or system has an element of efficiency and irrigation systems are no exception. With various natural and physical constraints these cannot be expected to run at 100% efficiency. Therefore an overall gap of 10% in potential created and utilised should not be considered abnormal.

No.25(1)/A/96-I&CAD
Government of India
Planning Commission

Annex I(1)

Yojana Bhawan,
Sansad Marg,
New Delhi,

Dated 31.10.1995.

ORDER

Sub: Constitution of a Working Group on Major & Medium Irrigation Programme for the Ninth Five Year Plan.

With a view to formulate the draft Ninth Five Year Plan (1997-2002), it has been decided to set up a Working Group on Major & Medium Irrigation Programme with the following composition:

- | | | |
|-----|---|------------------|
| 1. | Secretary, Ministry of Water Resources | Chairman |
| 2. | Adviser(I&CAD), Planning Commission | Member |
| 3. | Commissioner(Projects), Ministry of Water Resources | Member |
| 4. | Financial Adviser, Ministry of Water Resources | Member |
| 5. | Jt Secretary(FB), Department of Economic Affairs, Ministry of Finance | Member |
| 6. | Addl Secretary & Agrl Commissioner, Dept of Agriculture & Cooperation, Ministry of Agriculture | Member |
| 7. | Economic & Statistical Adviser, Ministry of Agriculture | Member |
| 8. | Member(HP), Central Electricity Authority | Member |
| 9. | Chief Engineer(Mon), CWC | Member |
| 10. | A Representative from the Ministry of Environment & Forest | Member |
| 11. | A Representative of Min. of Welfare | Member |
| 12. | A Representative from Department of Science and Technology | Member |
| 13. | Sh Ashok Gulati, Chief Economist, National Council of Applied Economic Research, Parisila Bhawan, II-Indra Prastha Estate, New Delhi-110002 | Member |
| 14. | Member(WP), CWC, New Delhi | Member-Secretary |

State Irrigation/Water Resources Secretary of:

1.	Andhra Pradesh	Member
2.	Bihar	Member
3.	Gujarat	Member
4.	Karnataka	Member
5.	Madhya Pradesh	Member
6.	Maharashtra	Member
7.	Rajasthan	Member
8.	Orissa	Member
9.	Uttar Pradesh	Member

Non Official:

- | | | |
|----|---|--------|
| 1. | Sh S.T.Deokule,
Former Prl Secretary to Govt of Maharashtra
Flat No:2, Sham Gokul,
Natwarnagar, Road No.2
Society Road, Jageshwari (East),
Bombay-400060 | Member |
| 2. | Sh J.F.Mistry,
Former Secretary to Govt of Gujarat,
Shyam, Flat 378/A,
Sector-23,
Gandhinagar-382010 (Gujarat) | Member |
| 3. | Sh Basawan Sinha,
Former Engineer-in-Chief, Bihar,
41, Surya Apartments,
Fraser Road, Patna-800001 | Member |
| 4. | Sh M. Krishnappa,
Former Secretary to Govt of Karnataka,
No.1921, 30th Cross, 13th Main,
Banashankari, 2nd Stage,
Bangalore-560070 | Member |

Terms of Reference:

- i) To review the performance State-wise as well as of Central Sector in terms of physical and financial targets of the Eighth Five Year Plan, identify the constraints, shortcomings and distortion, if any, in the implementation with regard to end result of irrigation development and cost efficiency and suggest remedial/corrective measures.
- ii) To suggest appropriate strategy and formulate proposals for the Ninth Five Year Plan (1997-2002) in terms of year-wise physical targets and financial investments for each State and for schemes in the Central Sector, while keeping in view the ultimate potential as well as target set under the National Perspective for water resources development prepared by the Ministry of Water Resources as well as the needs of the 20 point programme for the targets of benefits for the Five Year Plan. The needs of

drought prone, tribal/backward areas, regional imbalance and special component plans for scheduled castes and scheduled tribes both in terms of financial investment and physical targets may also be specifically taken into account and the priorities for development be accordingly indicated.

- iii) To work out the balance investment for ongoing major and medium projects as well as the potential involved and suggest appropriate strategy and physical and financial programme for completion of as many ongoing schemes as possible by the end of the Ninth Plan period.
- iv) To review the existing mechanism of Control Boards with regard to funding and implementation of inter-state projects and suggest appropriate measures for resolving such problems including provision of adequate outlays.
- v) To suggest measures for ensuring that basin wise land use perspective plans and water resources development master plans are drawn in a phased manner before the end of 9th Five Year Plan with due prioritisation to the basins with respect to the present state of their development as well as future scenario.
- vi) To evolve realistic strategy and measures for improving the efficiency of existing irrigation systems and promoting equitable distribution of water in the entire command of the Irrigation Projects, including the programme for modernisation/renovation of old irrigation projects constructed upto 25 years ago with a view to turn over these systems to WUAs under the broad strategy of Participatory Irrigation Management. The investment for the modernisation programme including the extension of the distribution from 40 ha block to 5/8 ha blocks in the completed irrigation projects may be specifically indicated and duly supported with its phasing and its priorities in various States for the Ninth Five Year Plan period. The changes required in the irrigation practices and procedures in consonance with the requirement of modern agriculture may also be taken into account for modernisation of the projects.
- vii) To suggest appropriate measures for reducing the financial losses from irrigation works, particularly the need for stepping up revenue from the irrigation works to cover at least O&M costs initially upto 2000 AD and subsequently to cover even the capital cost. The recommendations of the Tenth Finance Commission may be taken into consideration. In this context model of a self-financing project with standard scale of O&M costs may also be drawn, taking both direct and indirect revenue from water rates,
- viii) To recommend appropriate strategies and measures for successful implementation of the Five Year Plan on the basis of a malady-remedy analysis, which would include recommendations for personnel policies to help minimise the adverse impact, administrative/managerial constraints in the implementation of the programme.

- ix) To suggest measures for improving the statistical data base, planning, design and monitoring capability both at State and Centre for irrigation development on sustainable basis. In this context, review of existing water resources/hydrological data including the quality may also be undertaken with suggestive measures to improve them.
- x) To suggest the procedures for ensuring allocation of adequate resources for the sector given its priority.
- xi) To assess the additional employment during the construction and operational stages of various categories of personnel and the training needs for implementation of the plan.
- xii) To prepare a Science and Technology Plan for the irrigation sector so that S&T programme could be evolved suitably.
- xiii) To examine the follow up action taken on the recommendations of the Public Accounts Committee made in report (Tenth Lok Sabha) and recommend such changes in context of the irrigation development programme for the Ninth Five Year Plan.
- xiv) The Working Group may coopt a Member(s) as may be required.

Expenditure of the Members on TA/DA in connection with the meetings of the Working Group will be borne by the respective Departments/Ministries/Organisations. Expenditure in respect of non-official members will be borne by the Planning Commission as per rules and regulations of TA/DA as applicable to Group 'A' Officers of the Government of India.

The Working Group shall submit its final report to the Planning Commission by March 31, 1996.

Sd/-
(Gurjot Kaur)
Director (Administration)

To
Chairman and all Members of the Working Group.

Copy to:
1. The Secretary, Ministry of Water Resources, SS Bhawan.
2. The Secretary, Dept of Agriculture & Coopn, Ministry of Agriculture.

Copy also to:
PS to Deputy Chairman
PS to Secretary/Spl Secretary
Adviser (SP)/Adviser(Agri)/Adviser(PC)
Joint Secretary(s)

Sd/-
(Gurjot Kaur)
Director (Administration)

No.25(1)/A/96-I&CAD
Planning Commission
(I&CAD Division)

Yojana Bhawan, Sansad Marg,
New Delhi, dated 05.01.1996.

A D D E N D U M

Sub: Working Group on Major & Medium Irrigation for the
formulation of Ninth Five Year Plan (1997-2002).

In continuation of Planning Commission's Order of
even no dated 31st October, 1995 setting up the Working Group on
Major and Medium Irrigation for the formulation of the Ninth Five
Year Plan, it has been decided to include Dr B.P.Das,
Engineer-in-Chief, Water Resources Department, Government of
Orissa, Buvaneswar, as a member of the Group.

Sd/-
(Gurjot Kaur)
Director (Administration)

To:
Chairman and all the Members of the Working Group/
Steering Committee.

Copy forwarded to:

1. PS to Deputy Chairman, Planning Commission
2. PS to MOS for Planning & Programme Implementation.
3. PS to Member(P), Planning Commission
4. PS to Member-Secretary, Planning Commission
5. All Advisers/Heads of the Divisions, Planning Commission
6. Administration-I,II,III,IV & V, Planning Commission.
7. General Branch-I & II, Planning Commission
8. Accounts-I Branch, Planning Commission
9. PS to Director(Admn), Planning Commission
10. Dr B.P.Das, Engineer-in-Chief, Water Resources Department,
Government of Orissa, Secha Sadan, Bhuvaneswar-751 001.

Sd/-
(Gurjot Kaur)
Director (Administration)

No 25(1)/A/96-I&CAD
Planning Commission
(I&CAD Division)

Yojana Bhawan, Sansad Marg,
New Delhi, dt 6.2.1996

A D D E N D U M

Working Group on Major & Medium Irrigation for the
formulation of Ninth Five Year Plan (1997-2002).

In continuation of Planning Commission's Order of
even number dated 31st October, 1995 regarding setting up the
Working Group on Major & Medium Irrigation for the formulation of
the Ninth Five Year Plan, it has been decided to include a
representative of the Indian Council of Agricultural Research as
a member of the Working Group.

Sd/-
(Gurjot Kaur)
Director(Administration)

To
Chairman and all the members of the Working Group/Steering
Committee.

Copy forwarded to:

1. PS to Deputy Chairman, Planning Commission
2. PS to MOS for Planning & Programme Implementation
3. PS to Member(P), Planning Commission
4. PS to Member-Secretary, Planning Commission
5. All Advisers/Heads of the Divisions, Plg Commission
6. Administration-I,II,III,IV &V,Planning Commission
7. General Branch I & II, Planning Commission
8. Accounts-I Branch, Planning Commission
9. PS to Director(Admn), Planning Commission
10. Dr T.N.Chaudhary, ADG(IWM), Indian Council of Agricultural
Research, Krishi Bhawan, New Delhi.

Sd/-
Director(Admn)

B.N.NAVALAWALA
Adviser (I&CAD),
Tel: 3710273

Planning Commission,
Yojana Bhavan,
New Delhi-110001

DO No 25(2)/96-I&CAD

Dt Feb 14, 1996

Dear Shri Hasan,

As approved by the Member (Irrigation), Planning Commission and Chairman of Steering Committee of Irrigation sector for 9th Plan, Shri C.M.Vasudev, Additional Secretary, Department of Economic Affairs is to be invited as a Special Invitee for all the meetings of your Working Group. You may, kindly take further action in the matter.

With warm regards,

Yours Sincerely.

(B.N.Navalawala)

Sh Z.Hasan,
Member (WP&P),
Central Water Commission,
Sewa Bhawan,
R.K.Puram,
New Delhi-110 066

No.25(1)/A/96-I&CAD
Government of India
Planning Commission
(I&CAD Division)

Yojana Bhavan,
Sansad Mard,
New Delhi.

Dated 17th April, 1996.

A D D E N D U M

Sub: Working Group on Major & Medium Irrigation Programme
for formulation of the Ninth Five Year Plan.

In continuation of Planning Commission's Order of even no dated 31st October, 1995 setting up the Working Group on Major & Medium Irrigation Programme for the formulation of the Ninth Five Year Plan, it has been decided to include the following officer of the perspective Planning Division as Official Member of the Working Group as mentioned below:

Name of the
Working Group

Proposed Officer
of P.P.Division

Working Group on
Major and Medium Irrigation

Sh T.S.Krishnan,
Deputy Adviser(PP)
Planning Commission

Sd/-
(Gurjot Kaur)
Director(Administration)

To

The Chairman and Members of the
Working Group on Major & Medium Irrigation.

Annex I (2)

No.8/10/95-P&P/53-93
Government of India
Central Water Commission

Sewa Bhawan, R.K.Puram,
New Delhi-66, dt 19.1.96

OFFICE MEMORANDUM

Sub: Constitution of Sub-Groups to assist the Working Group on Major & Medium Irrigation for the IX Five Year Plan.

In the first meeting of the Working Group chaired by Secretary (WR), Ministry of Water Resources on 11.1.96 it was decided to form 3 (three) Sub-Groups for TOR (vi), (viii), & (ix) to assist the Working Group. Accordingly, three sub-groups with the following composition and broad function are hereby constituted with the approval of the Chairman of the Working Group.

1. Sub Group for TOR No (vi):

" To evolve realistic strategy and measures for improving the efficiency of existing irrigation systems and promoting equitable distribution of water in the entire command of the Irrigation Projects including the programme for modernisation/renovation of old irrigation projects constructed upto 25 years ago with a view to turn over these systems to WUAS under the broad strategy of Participatory Irrigation Management. The investment for the modernisation programme including the extension of the distribution from 40 ha block to 5/8 ha blocks in the completed irrigation projects may be specifically indicated and duly supported with its phasing and its priorities in various States for the Ninth Five Year Plan period. The changes required in the irrigation practices and procedure may also be taken into account for modernisation of the projects".

Constitution:

- | | | |
|------|---|----------------------|
| i) | Sh S.T.Deokule,
Former Prl Secretary, Irrigation,
Maharashtra. | Chairman |
| ii) | Commissioner (CAD), MOWR, New Delhi | Member |
| iii) | Sh M.D.Pendse, CE, Irrigation
Department, Maharashtra | Member |
| iv) | Sh B.P.Das, CE, Irrg Dept, Orissa | Member |
| v) | Sh Ashok Kumar, Sr Scientist, Deptt
of Agriculture & Coop, New Delhi | Member |
| vi) | Sh Mohammed Alam, CE, Designs
WR Deptt, Govt of Bihar, Patna | Member |
| vii) | Sh C.D.Khoche, Director,
Irrigation Planning, CWC | Member-
Secretary |

Broad Functions:

- i) To recommend the strategy and measures for improving the efficiency of the existing irrigation systems including the programme of modernisation of the old irrigation projects with a view to turn over these systems to WUAs under broad strategy of Participatory Irrigation Management.
- ii) To recommend specific items of work to be taken up under modernisation during the IX Plan taking into account the guidelines for modernisation of projects already issued by CWC.
- iii) To recommend changes required in the irrigation practices and procedure in consonance with the requirement of modern agriculture.
- iv) To recommend priority to be given to Modernisation schemes in the IX Plan in various states taking into account the progress of creation of potential upto the end of VIII Plan.
- v) To recommend the essential items of works to be taken up under modernisation and particularly the necessity or otherwise of lining the entire canals and distribution systems.
- vi) To suggest measures for promoting equitable distribution of water in the entire command of the irrigation projects.
- vii) To recommend any other matters relevant taking into account the TOR (vi) of the Constitution of the Working Group.

2. Sub-Group for TOR Mo: (viii):

" To recommend appropriate strategies and measures for successful implementation of the Five Year Plan on the basis of malady - remedy analysis, which would include recommendations for personnel policies to help minimise the adverse impact administrative/managerial constraints in the implementation of the programme".

Constitution:

- | | | |
|------|--|----------------------|
| i) | Sh J.F. Mistry
Former Secretary, Irrg, Gujarat | Chairman |
| ii) | Sh M.A. Bandi
CE & Jt Secy, WRD, Gujarat | Member |
| iii) | Sh M. Krishnappa, Former Secy to
Govt of Karnataka, Bangalore | Member |
| iv) | Chief Engineer, Irrg Deptt, A.P | Member |
| v) | Sh V.T. Londe, CE, BODHI, Bhopal,
Madhya Pradesh | Member |
| vi) | Sh P.R.Chopra, Director, Monitoring,CWC | Member-
Secretary |

Broad Functions:

- i) To recommend appropriate strategies and measures for successful implementation of IX Five Year Plan on the basis of malady-remedy analysis.
- ii) To recommend personnel policies to help minimise adverse impact, administrative/managerial constraints in the implementation of the programme.
- iii) To recommend any other matter relevant to TOR (viii) of the Working Group.

3. Sub-Group for TOR (xi):

" To assess the additional employment during the construction and operational strategies of various categories of personnel and the training needs for implementation of the plan".

Constitution:

- | | |
|--|----------|
| i) Sh Basawan Sinha
Former Engineer-in-Chief, Bihar | Chairman |
| ii) Director, WALMI, Aurangabad, Maharashtra | Member |
| iii) Nominee of Institute of Economic
Growth, Delhi | Member |
| iv) Representative of IIM, Ahmedabad | Member |
| v) CE (CMO), CWC, New Delhi | Member |
| vi) Director (Trg), CWC | Member |

Broad Functions:

- i) To assess the additional employment of various categories of personnel for construction and operation during plan.
- ii) To assess the training needs for such personnel taking into account the existing facilities available in various States and to recommend concrete measures required for providing necessary training facilities during the IX Plan.
- iii) To recommend any other matter relevant to item (xi) of TOR for the Working Group.

All the Sub-Groups are requested to finalise their reports within a period of two months and submit the same to the Chairman and Member-Secretary of the Working Group ie., Secretary (WR) and Member (WP&P), CWC respectively. It would be very useful if the interim reports of the sub-groups are ready for discussions during the second meeting of Working Group scheduled to be held on 23rd February, 96.

: 4 :

The TA/DA of the Non-Official members will be borne by the Ministry of Water Resources. The TA/DA of official members will be borne by the respective departments.

Sd/-
(Z. Hasan)
Member (WP&P), CWC
Convenor of the W.G.

To

1. The Chairman and members of the Sub-Groups.
2. The Chairman and members of the Working Group.
3. PS to Secretary, Water Resources.

No.8/10/95/P&P/285to 294
Government of India
Cantral Water Commission

Room No 415, Sawa Bhawan,
R.K.Puram, New Delhi-110066

Dated the 9th February, 1996.

Sub: Constitution of sub-groups to assist the Working Group on Major and Medium Irrigation Programme for the IX Five Year Plan.

A Working Group has been constituted by the Planning Commission for drawing proposals for the IX Five Year Plan under the Chairmanship of Secretary, Ministry of Water Resources vide letter No.25(1)/A/96-I&CAD dated 31.10.95 (copy enclosed). The first meeting of the Working Group was held on 11.1.96. In this meeting the Working Group recommended constitution of a sub-group under the Chairmanship of Dr Hanumantha Rao, former Member, Planning Commission under the Terms of Reference (x) of the Working Group viz " To suggest the procedures for ensuring allocation of adequate resources for the sector given its priority".

Accordingly, the sub-group is hereby constituted with the approval of the Chairman of the Working Group. The composition and broad functions of the sub-group will be as under:

Conatitution;

- | | | |
|-------|---|----------------------|
| i) | Dr Hanumantha Rao,
Former Member, Planning Commission' | Chairman |
| ii) | Sh Z. Hasan,
Member (WP&P), CWC | Member |
| iii) | Sh B.K.Taimini,
Addl Secretary, Dept of Agri & Coop. | Member |
| iv) | Sh A.A.P. Khare, Secretary, WRD,
Govt of M.P., Bhopal | Member |
| v) | Sh Ashok Gulati,
Chief Economist, NCAER,
II, I.P.Estate, Delhi. | Member |
| vi) | Sh N. Raghavan, C.G.M., NADARD, Bombay | Member |
| vii) | Sh Deepak Gupta, Secretary, WRD,
Govt of Bihar, Patna | Member |
| viii) | Sh P. Chengal ruddy, Director
PTR Foundation, Hyderabad | Member |
| ix) | Any Member nominated by the Chairman
of the Working Group. | |
| x) | Sh M.M.Mathur, Director(WRE), CWC | Member-
Secretary |

: 2 :

Broad Functions:

- i) To formulate justification for allocation of realistic outlay for Irrigation Sector.
- ii) To suggest modalities for raising the resources as in (i) above.
- iii) To explore possibilities of private sector participation by way of investment in irrigation sector.
- iv) Any other item considered relevant to the subject under the TOR (x) to the Working Group.

The Sub-Group is requested to finalise its report by April, 96 and submit the same to the Chairman and Member-Secretary of the Working Group, i.e., Secretary, Ministry of Water Resources and Member (WP&P), CWC, respectively. It will be useful if the interim report of the sub-group is submitted after the first meeting.

The meeting could be held at the convenience of the Chairman either at Hyderabad or Delhi.

TA/DA of the non-official members will be borne by the Ministry of Water Resources. TA/DA of official members will be borne by the respective departments.

Sd/-
(Z. Hasan)
Member-Secretary of
the Working Group
Ph: 608590
Fax : 6075516

To

Chairman and all members of the Sub-Group.

Copy to:

Chairman and all members of the Working Group.

MAJOR & MEDIUM IRRIGATION

STATEWISE FINANCIAL AND PHYSICAL PERFORMANCE

DURING VIII PLAN

Sl. No.	Name of State / Union Territory	Financial (Rs. crores)		Physical (Th. ha.)	
		VIII Plan Outlay	Likely Expenditure during 92-97	Target	Likely Achievement
STATES					
1.	Andhra Pradesh	2066.78	3401.23	419.00	355
2.	Arunachal Pradesh	4.71	2.49	-	-
3.	Assam	86.11	128.62	120.00	44
4.	Bihar	1927.17	1100.64	315.00	160
5.	Goa	114.70	129.28	36.20	10
6.	Gujarat	3426.00	2465.75	448.00	143
7.	Haryana	446.67	651.81	296.00	58
8.	Himachal Pradesh	16.00	14.27	2.64	1
9.	Janmu & Kashmir	70.57	93.13	20.50	17
10.	Karnataka	1936.09	2796.84	401.00	397
11.	Kerala	437.00	525.49	148.00	214
12.	Madhya Pradesh	1791.29	1444.01	450.00	351
13.	Maharashtra	2391.54	2811.11	400.00	266
14.	Manipur	125.00	157.80	54.16	32
15.	Meghalaya	11.10	9.20	3.88	-
16.	Mizoram	1.00	0.37	-	-
17.	Nagaland	2.00	2.13	-	-
18.	Orissa	2614.33	916.02	334.00	137
19.	Punjab	257.73	236.89	176.42	138

20.	Rajasthan	1310.08	1323.83	288.61	304
21.	Sikkim	-	-	-	-
22.	Tamil Nadu	260.00	363.45	10.30	7
23.	Tripura	35.00	29.32	13.20	-
24.	Uttar Pradesh	2599.34	1674.97	976.00	277.00
25.	West Bengal	380.00	431.34	170.53	174
	Total (States) :	22310.21	20710.08	5083.44	3076
26.	UNION TERRITORIES	9.32	9.36	4.21	4
	TOTAL (ALL-INDIA)	22319.53	20719.44	5087.65	3080

Annexure II (2)							
FINANCIAL PERFORMANCE OF MAJOR PROJECTS PROVIDED WITH OUTLAYS EQUIVALENT TO SPILLOVER COST							
ASSESSED AT THE BEGINNING OF VIII PLAN FOR COMPLETION DURING VIII PLAN PERIOD							
(Rs. Crores)							
Sl. No	Name of Project	Plan in which Started	At the Beginning of VIII Plan		At the end of VIII Plan		Likely Completion Plan
			Estimated Cost	Spillover Cost	Estimated Cost (As per A.P. 95-96)	Spillover Cost	
Andhra Pradesh							
1.	Sriram Sagar	III	1027.00	362.53	363.00	1519.15	492.78 IX
2.	Vamsadhara St. I	IV	73.85	24.51	25.00	78.60	4.62 IX
3.	Pulivendula Canal	IV	26.78	12.57	13.00	34.51	7.81 IX
4.	Singur	V	130.42	14.57	15.00	169.00	39.91 IX
5.	Sri Sallam RBC	VI	544.50	439.89	440.00	1185.58	640.85 Beyond IX Plan
6.	Nagarjuna Sagar	II	778.00	76.48	77.00	950.00	121.48 IX
Assam							
7.	Pahumara	AP 78-80	26.84	4.64	5.60	26.84	- VIII
8.	Champamati	VI	47.79	17.20	21.93	75.00	37.31 IX
9.	Dhansiri	V	100.53	15.26	15.26	200.00	81.03 IX
Bihar							
10.	Western Kosi Canal	III	357.44	160.48	160.50	357.44	85.14 IX
11.	North Koel Res.	V	246.00	132.18	132.18	475.00	42.92 IX
12.	Durgavathi	V	147.40	76.01	76.00	147.40	58.18 IX
13.	Ajoy Barrage Siktia	V	133.00	55.49	68.27	133.11	38.95 IX
14.	Gumati Barrage	V	58.42	34.44	35.45	58.42	29.07 IX
15.	Dakranela Pump Ph. I	AP 78-80	79.57	35.44	35.38	79.57	23.22 IX
16.	Sindh Wairi	VI	21.95	15.96	16.43	21.95	9.94 IX
Goa							
17.	Salauli	IV	92.39	22.36	25.00	130.50	10.06 IX
Gujarat							
18.	Sabarmati	IV	110.72	5.00	5.00	110.72	- VIII
19.	Karjan	V	224.79	38.94	39.22	224.74	- VIII
20.	Sipu	AP 78-80	94.10	21.20	25.00	94.10	- VIII
21.	Watrak	AP 78-80	56.70	6.20	7.68	56.70	- VIII
22.	Daman Ganga	IV	204.43	28.10	28.10	204.53	- VIII

Maryana -----							
23. J.L.M. Lift	V	164.97	5.80	14.00	190.00	22.19	IX
24. Gurgaon Canal	III	40.41	13.80	12.47	40.41	9.96	IX
25. Const. S.V.L. Project	V	559.00	110.06	118.85	641.41	89.68	IX or Beyond IX Plan
Karnataka -----							
26. Tungabhadra R.B. MLC.	II	32.50	10.26	11.66	55.00	0.50	VIII
27. Malaprabha	III	375.05	103.31	114.14	528.73	84.89	IX
28. Bhadra	I	80.14	10.67	12.80	120.75	8.63	VIII
29. Tungabhadra Dam & LBC	I	112.55	4.99	5.45	220.00	13.22	VIII
30. Karanja	V	109.94	37.85	42.00	258.17	98.93	IX
Kerala -----							
31. Pamba	III	61.25	0.80	1.00	63.40	-	VIII
32. Kanhirapuzha	III	66.74	9.62	8.00	59.78	28.78	IX
33. Pazhassi	III	89.12	12.66	12.00	83.57	-	VIII
34. Kallada	III	457.80	99.79	99.80	457.80	-	VIII
35. Muvattupuzha	V	89.25	37.94	49.00	89.25	-	VIII
36. Chimoni	V	36.66	1.96	4.00	40.66	-	VIII
37. Idamalayar	VI	67.40	41.05	41.00	67.40	-	VIII
Madhya Pradesh -----							
38. Kolar	IV	157.40	31.29	31.29	185.00	17.63	IX
39. Palry	IV	33.53	13.84	13.84	33.54	4.69	IX
40. Jonk	IV	46.38	23.85	23.85	46.38	14.02	IX
41. Upper Wainganga	V	149.88	29.59	29.59	176.53	13.15	IX
42. Koder	V	38.28	14.92	14.92	49.83	17.93	IX
43. Sindh Ph. I	IV	35.52	6.87	6.87	56.43	14.83	IX
44. Tawa	II	128.90	4.79	4.79	140.00	-	VIII
45. Thanwer	AP 78-80	24.40	5.04	5.04	24.40	-	VIII
46. Malali	AP 78-80	20.57	2.44	2.44	20.57	-	VIII
47. Bariarpur LBC	V	84.60	50.04	50.00	143.00	89.09	IX Plan
- Urmit (IS)	V	20.70	10.57	10.57	20.70	-	VIII
48. Mahi	VI	99.50	74.13	74.00	129.70	84.18	IX Plan

Maharashtra							

49. Khedekwasla	II	202.50	67.58	68.00	202.50		VIII
50. Krishna	III	224.14	75.00	75.00	716.00	31.94	IX
51. Upper Tapi	IV	101.32	20.95	21.00	93.00	0.67	IX
52. Bhatse	V	83.41	45.64	46.00	240.00	181.90	Beyond IX Plan
53. Jayakwadi St. II	V	650.46	143.00	143.00	867.00	429.83	IX
54. Lower Tirna	VI	122.94	50.94	51.00	122.94	-	VIII
55. Lower Wurna	VI	95.34	44.57	45.00	95.34	-	VIII
56. Ishtapuri (Vishnupuri)	AP 78-80	157.75	75.00	75.00	197.00	6.65	IX
57. Arunavathi	VI	89.57	40.88	41.00	89.57	-	VIII
58. Tillari	AP 78-80	43.32	20.45	20.00	256.00	215.08	Beyond IX Plan
59. Wan	VI	70.80	45.93	46.00	135.00	14.97	IX
60. Karwa	VI	29.46	14.36	14.00	29.46	-	VIII
Manipur							

61. Thoubal	AP 78-80	150.00	71.57	71.57	223.02	83.01	IX
Orissa							

62. Upper Kolab Irrigation	V	160.00	75.86	76.00	205.83	17.00	IX
63. Upper Indravati Dam	AP 78-80	139.11	40.92	50.00	182.33	36.99	IX
Irrigation	AP 78-80	338.17	256.34	256.00	539.51	351.31	IX
64. Mahanadi Chitrotpala	VIII	93.07	87.26	87.00	108.73	77.02	IX
Rajasthan							

65. Indira Gandhi Nahar St I	II	255.00	12.09	12.09	280.00	-	VIII
66. Jakham	III	84.80	18.01	18.00	93.50	-	VIII
- Gurgaon Canal	III	33.16	12.69	12.70	35.40	10.16	IX
Uttar Pradesh							

67. Gandak Canal	III	158.77	26.00	26.00	158.77	-	VIII
68. Sarada Sahayak	III	1064.60	325.30	300.00	1064.60	124.92	IX
69. Lakhwar Wyasi	V	319.00	194.18	194.18	369.00	203.29	Beyond IX Plan
70. Madhya Ganga Canal	V	408.06	132.82	145.00	506.68	53.37	IX
71. Eastern Ganga Canal	V	266.55	120.76	120.00	308.77	75.34	IX
72. Urmil Dam	V	26.03	3.43	3.43	26.73	-	VIII
73. Ban Sagar Dam	V	112.00	57.14	57.14	185.00	36.40	IX
74. Maudaha Dam	V	76.21	15.41	15.41	76.21	-	VIII

75. Bower Feeder	V	29.74	3.54	3.54	33.73	-	VIII
76. Sone Pump Canal	V	72.55	33.14	33.14	72.55	22.29	IX
77. Chittaurgarh Res.	V	30.94	10.64	10.42	30.94	-	VIII
78. Gyanpur Pump Canal	VII	111.87	55.35	54.30	111.87	27.97	IX
79. Paddy Channel in Hindon - Krishni Doab	VII	26.30	23.31	23.31	26.30	-	VIII
West Bengal							

80. Barrage & Irrigation System D.V.C.	I	60.00	15.42	15.42	60.00	-	VIII

Annexure II (3)

PROJECTS LIKELY TO BE COMPLETED

DURING VIII PLAN

MAJOR PROJECTS

Sl. No.	Name of Scheme	Plan in which Started
	Andhra Pradesh	
	NIL	
	Assam	
1	Pahumara	AP 78-80
	Bihar	
	NIL	
	Goa	
	NIL	
	Gujarat	
2	Daman Ganga	IV
3	Sabarmati	IV
4	Karjan	V
5	Sukhi*	V
6	Sipu	AP 78-80
7	Watrak	AP 78-80
	Karnataka	
8	Bhadra	I
9	Tungabhadra RB HLC	II
10	Hemavathi*	AP 1966-69
11	Tungabhadra Dam & LBC	I
	Kerala	
12	Periyar Valley *	II

MAJOR PROJECTS

Sl. No.	Name of Scheme	Plan in which Started
13	Pamba	III
14	Chitturpuzha *	III
15	Kuttiadi *	III
16	Pazhassi	III
17	Kallada	III
18	Muvattupuzha	V
19	Chimoni	V
20	Idamalayar	VI
Madhya Pradesh		
-	Urmil	V
21	Halali (Samrat Ashok Sagar)	AP 78-80
22	{B Thanwar	AP 78-80
23	Tawa	II
Maharashtra		
24	Khadakwasla	II
25	Lower Thirna	VI
26	Lower Wunna	VI
27	Arunawathi	VI
28	Karwa	VI
Orissa		
29	Potteru*	IV
Rajasthan		
30	Harischandra Sagar *	I
31	Indira Gandhi Nahar Stage I	II
32	Jakhm	III
Uttar Pradesh		
Gandak Canal		
34	Urmil Dam	V

MAJOR PROJECTS

Sl. No.	Name of Scheme	Plan in which Started
35	Bewar Feeder	V
36	Maudaha Dam	V
37	Chithaurgarh Res.	V
38.	Paddy Channel in Hindan Krishni Doab	VII

* Projects other than those identified for completion at the beginning of VIII Plan - 9 Nos.

ANNEXURE-II (3A)

PROJECTS TAKEN UP AND COMPLETED
IN VARIOUS PLAN (CUMULATIVE)

PLAN	M A J O R		M E D I U M		E. R. M.	
	Taken up	Comple- ted	Taken up	Comple- ted	Taken up	Comple te
I Plan (1951-56)	44	5	169	35	12	3
II Plan (1956-61)	77	25	271	121	17	8
III Plan (1961-66)	109	35	315	181	25	15
Annual Plan (1966-69)	120	40	345	226	26	18
IV Plan (1969-74)	152	55	418	288	32	22
V Plan (1974-78)	222	61	718	354	53	22
Annual Plan (1978-80)	235	63	770	371	56	24
VI Plan (1980-85)	265	95	861	519	101	29
VII Plan (1985-90)	277	111	894	655	146	43
Annual Plan (1990-92)	278	120	894	668	146	51
VIII Plan (1992-97)	292	158	944	768	162	96

ANNEXURE - II (4)

PROJECTS TO BE TREATED AS NEW PROJECTS OF IX PLAN

MAJOR

Andhra Pradesh

1. Vamsadhara St. II

Gujarat

2. Zankari

Haryana

3. Nalvi

Himachal Pradesh

4. Shahnahar

Kerala

5. Chaliyar (Beyporepuzha)

Maharashtra

6. Nira Deogarh

7. Lower Dudhna

8. Lower PLenganga

9. Lendi

10. Lower Wardha

11. Talomba

12. Tultuli

PROJECTS DROPPED BY STATES

Bihar : Masan Dam

PROJECTS TO BE TREATED AS NEW PROJECTS OF IX PLAN

ERM SCHEMES

Assam

1. Jajligaon Modernisation
2. Kaliabar Modernisation
3. Rupahi Modernisation
4. Bordikeraï Modernisation

Kerala

5. B/R at Chamaravattam)Dropped by
6. B/R at Kanakankadavu)State Govt.

ANNEXURE - II(4a)

NEW SCHEMES TAKEN UP IN VIII PLAN: MAJOR PROJECTS

(i.e >5% Expenditure)

Andrapradesh

1.Sunkesula

2.Alaganur Bal.Res

Karnataka

3.Upper Tunga

Kerala

4.Kuriarkutty Karapara

Mahrashtra

5.Bembala

6.Bhima Asakhede

7.Jamai shirani

8.Sina Kolegaon

Orissa

9.Kanupur

10.Mahanadi Chitrotpala

Expenditure < 5%

11. Chailyar

12.Nira Deogarh

13.Lower Dudhna

14.Lower Penganga

Annexure II(5)

MAJOR & MEDIUM IRRIGATION PROJECTS
IN DROUGHT PRONE AREA

		Th.ha.	
Sl. No.	Name of Project	Ultimate Potential	Remarks

Andhra Pradesh			

Major			

1.	Srisaillam RBC	76.80	
2.	Nagarjuna Sagar	895.28	
3.	Tungabhadra HLC St. II	89.82	
4.	Jurala	44.40	
5.	Telugu Ganga	233.00	
6.	Srisaillam LBC	121.41	
7.	Pulivendla Branch	24.28	
Medium			

8.	Cheyzeru Project	7.90	
9.	Buggawanka	5.04	
10.	Maddileru	5.21	
Bihar			

Major			

1.	Auranga	55.40	
2.	Barnar	22.40	
3.	Bansagar	NA	
4.	Durgavathi	29.21	
5.	North Koel	104.72	
6.	Tilaiya	48.60	
Medium			

7.	Batane	9.87	
8.	Dakranalla Pump Ph. I	6.50	
9.	Malia	7.74	

10.	Sindhwarni	9.38
	Gujarat	

	Major	

1.	Panam	49.37
2.	Sabermati	61.09
3.	Karjan	77.56
4.	Sipu	22.08
5.	Sardar Sarovar (Irrigation)	1792.00
	Medium	

6.	Sukh Bhadar	5.41
7.	Kalubher	4.70
8.	Machhan Nalla	4.33
9.	Deo	10.16
10.	Venu-II	5.25
11.	Und (Jivapur)	9.59
12.	Bhadar (Panchmahal)	8.00
13.	Hadaf	5.24
14.	Sani	2.76
15.	Umaria	2.37
16.	Aji II	2.38
17.	Aji III	6.84
18.	Demi II	2.42
19.	Und II (Gunatit Sarovar)	4.25
20.	Goma	5.00
21.	Aji IV	4.00
22.	Gunda	3.84
23.	Singor	2.20
24.	Koliyari	2.26
25.	Varansi	2.40
	ERM	

26.	Machhu I (Dam Strengthening)	-
27.	Machhu II (Reconstruction)	9.99
28.	Modernisation of Kharicut Canals	2.07

29.	Modernisation of Fatewadi Canals	4.47
30.	Dantiwada Modernisation	12.13
31.	Modernisation of Bhadar (S) Canals	1.71
32.	Modernisation of Shetrunji (P) Cana	3.78
33.	Modernisation of Machhu I Canals	1.07
34.	Prevention of Salinity Ingress (Saurashtra Coastal Development)	18.27
35.	Restoration of Mitti	-
	Jammu & Kashmir	

	Major	

1.	Kashtigarh Canal	1.08
	Karnataka	

	Major	

1.	Bhadra	105.57
2.	Tungabhadra Dam & LBC	244.38
3.	Tungabhadra HLC	80.91
4.	Malaprabha	218.19
5.	Upper Krishna St. I	424.94
6.	Bennithore	20.24
7.	Hippargi Barrage	NA
8.	Dudhganga	19.67
9.	Kabini	87.90
10.	Harangi	59.69
11.	Hemavathy	NA
	Medium	

12.	Manchanabala	3.84
13.	Votehole	7.49
14.	Amarja	8.90
15.	Lower Mullawanri	9.71
16.	Maskinala	2.83
17.	Feeder Channel to Rani Khera	3.24
18.	Hirahalla	8.01
19.	Arkavathy	8.56
20.	Uduthorehalla	6.27

	ERM	

21.	Varuna (Mod. of Dev Raj Urs Canal)	32.38
22.	Modernisation of KRS Canal	2.12
	Madhya Pradesh	

	Major	

1.	Bansagar	249.00
2.	Rajghat	116.60
3.	Mahi	26.40
4.	Indira Sagar	123.00
5.	Man	15.00
6.	Jobat	9.85
7.	Omkareshwar	146.30
	Medium	

	Not Available	
	Maharashtra	

	Major	

1.	Bhima	162.50
2.	Kukadi	156.27
3.	Krishna	113.26
4.	Upper Godavari	67.29
5.	Chaskaman	38.62
6.	Koyna Krishna Lift Irrigation	36.31
7.	Nandur Madhneswar	45.12
8.	Punad	16.86
9.	Nira Deoghar	31.21
	Medium	

	Not Available	
	Orissa	

	Major	

1.	Upper Indravathi Dam	218.60
2.	Upper Jonk	NA

Rajasthan -----		
1.	IGNP Stage I	629.00
2.	IGNP Stage II	950.00
3.	Jakham	23.50
4.	Narmada (SSP)	73.16
5.	Som Kamla Amba	18.79
Medium -----		
6.	Somkadgar	4.95
7.	Jai Samand	8.35
8.	Gambhiri	4.77
9.	Bandi Sendra	1.85
Tamil Nadu -----		
Medium -----		
1.	Kalavarapalli Reservoir	3.24
2.	Orthupalayam Reservoir	4.20
ERM -----		
3.	Modernisation of Periyar Vaigai System St. II	8.12
4.	PAP Ayacut Extension	-
5.	Kodaganar Reservoir Reconstruction	3.79
Uttar Pradesh -----		
1.	Urmil Dam	4.77
2.	Moudaha Dam	28.24
3.	Rajghat	109.05
4.	Bansagar	150.13
5.	Sarda Sahayak	1582.00
6.	Sone Pump Canal	65.06
7.	Gyanpur Pump Canal	65.42
8.	Kanhar Irrigation	33.13
Medium -----		
9.	Gunta Nala Dam	3.88
10.	Khajuri - Lalganj Canal	3.53

11.	Lakheri Dam	2.99
12.	Resin Dam	2.79
13.	Bharat Uttori DAm	10.00
14.	Jasauli Dam	-
	ERM	

15.	Increasing Capacity of Narainpur Pump Canal	73.14
16.	Raising Meja Dam	17.88
17.	Increasing Capacity of Manda Pump Canal	-
	West Bengal	

	Major	

1.	Barrage & Irrigation System DVC	515.38
2.	Kangsabati Project	401.66
	Medium	

3.	Barabhum	2.73
4.	Sali Irrigation	0.59
5.	Golmarjore	1.00
6.	Ramchandraplur	2.56
7.	Sali Diversion	2.27
8.	Mouterejore	1.08
9.	Hanumata	2.78
10.	Tatka	2.48
11.	Patloi	2.16
12.	Beko	1.59
13.	Lipaniyajore	1.59
14.	Parga	0.92
15.	Karrior	0.51
16.	Putiary	1.20

Annexure II (6)

LIST OF MAJOR & MEDIUM IRRIGATION
PROJECTS UNDER TRIBAL SUB PLAN

Sl. No.	Name of Project	Remarks

	Andhra Pradesh	

	Medium	

1.	Taliperu	
2.	Gundalavagu	
3.	Sath Nala	
4.	Madigadda	
5.	Chaplu Mala Vagu (Near Irkapally)	
6.	Veligallu Reservoir	
	Assam	

	Major	

1.	Dhansiri	
2.	Champamati	
3.	Integrated Kallong	
	Medium	

4.	Buridehing	
5.	Borolia	
6.	Dekadong	
7.	Pahumara	
8.	Rupahi	
	ERM	

9.	Modernisation of Jamuna	
10.	Modernisation of Sukla	
11.	Modernisation of Lenga	
12.	Modernisation of Jajlaigaon	

Bihar

Major

1. Subernrekha
2. Ajoy Barrage
3. Punasi Reservoir

Medium

4. Kans Reservoir
5. Jharjhara Reservoir
6. Sakri Gali Pump
7. Gumani Barrage
8. Torai Reservoir
9. Sonua Reservoir
10. Suru Reservoir
11. Latratu Reservoir
12. Kansjore Reservoir
13. Upper Sankh Reservoir
14. Surangi Reservoir
15. Nakate Reservoir
16. Ramrekha Reservoir
17. Satpotka Reservoir
18. Dhan Singh Toli Reservoir
19. Baski Irrigation Cum Water Supply Scheme
20. Katri Reservoir
21. Malai Irrigation

Gujarat

Major

1. Jhankari
2. Karjan
3. Sidumber

Medium

4. Machhnala
5. Umaria
6. Ver II (Aml)
7. Jhuj
8. Kolia
9. Harnav II
10. Man
11. Ani
12. Jaloda
13. Singor
14. Koliyari

Kerala

Medium

1. Attapaddy

Madhya Pradesh

Major

1. Mahan
2. Hasdeo Bango (Minimata) (SCP)
3. Mahanadi Project (SCP)

Medium

4. Matiyari
5. Banki
6. Ghunghutte
7. Dhanawad
8. Banjar
9. Khamarpakut
10. Mand Diversion
11. Dejla Dewada
12. Barnai
13. Koserteda

14. Gej
15. Barchar
16. Gopad LIS
17. Sutiapas
18. Uribag
19. Mohra LIS
20. Bilhatola LIS
21. Tumarha LIS
22. Toksar LIS
23. Khairaba LIS
24. Jaitpur LIS
25. Nanghatta LIS

Maharashtra

Major

1. Surya
2. Upper Godavari
3. Bhatse
4. Ghosi Khund
5. Punad

Medium

6. Alandi
7. Chena Nadi
8. Pakadi Gudam
9. Karwappa Nala
10. Doongar Gaon
11. Dehali

Manipur

Major

1. Khuga Multipurpose Project

Orissa

Major

1. Upper Kolab Dam
2. Upper Indravathi Dam
3. Subernrekha
4. Potteru (Central Sector Project)
5. Kanupur
6. Ib

Medium

7. Harbhangi
8. Badanala
9. Deo
10. Baghalati
11. Telengu
12. Katara
13. Satiguda

Rajasthan

Major

1. Mahi Bajaj Sagar Unit I & II
2. Jakham
3. Som Kamla Amba

Medium

4. Som Kadgar
5. Sukhi

ERM

6. Jai Samand

West Bengal

Major

1. Upper Kangsabathi
2. Teesta Barrage (1st Sub-stage)
3. Kangabati Reservoir
4. Barrage & Irrigation System of DVC (Extension & Improvement)
5. Subernrekha Barrage

Medium

6. Sali REservoir
7. Barabhum
8. Parga Irrigation Scheme
9. Montorejore Irrigation Scheme
10. Beko Irrigation Scheme
11. Patloi Irrigation Scheme
12. Tatko Irrigation Scheme
13. Lipaliajore Irrigation Scheme
14. GolamarjoreIrrigation Scheme
15. Futiary Irrigation Scheme
16. Hinglow Irrigation Scheme
17. Khaina Baria Irrigation Scheme
18. Extension of Bandhu Irrigation Scheme
19. Dangra Irrigation Scheme
20. Karu Irrigation Scheme
21. Dambera Irrigation Scheme
22. Horai Irrigation Scheme
23. Sobha Irrigation Scheme
24. Saphai Irrigation Scheme
25. Rajbandhu Irrigation Scheme
26. Atla Irrigation Scheme
27. Patharikuri Irrigation Scheme

ERM

28. Mayurakshi
29. DVC Irrigation Scheme
30. Kangsabati (Phase I)

ANNEXURE - II (7)

STATUS OF UNAPPROVED PROJECTS
ONGOING MAJOR PROJECTS OF EIGHTH PLAN

SL. NO.	NAME OF PROJECT	STARTED IN PLAN	CLEARED BY TAC	UNDER TECHNICAL EXAMINATION	DELETED FROM CWC LIST	PROJECT REPORT NOT RECEIVED	REMARKS
1	2	3	4	5	6	7	8
ANDHRA PRADESH							
1	Yeleru Reservoir	VI	X				
2	Srisaillam LBC	VI			X		
3	Telugu Ganga	VI		X			Deferred by TAC
4	Jurala	VI	X				
5	Vamasdhara Stg.II	VI	X				
BIHAR							
6	Subernarekha	V	X				
7	North Koel Res.	V	X				
8	Konar Diversion	V		X			
9	Tilaiya Diversion	V		X			
10	Ajoy Barrage Siktia	V	X				
11	Punasi Res.	VII	X				
GOA							
-	Tillari	V					
HARYANA							
12	S.Y.L. Canal	V	X				
13	Nalvi	VII			X		
HIMACHAL PRADESH							
14	Shahnahar	VII	X				
JAMMU AND KASHMIR							
15	Ravi Tawi L.I.C.	V				X	
KARNATAKA							
16	Hippargi Barrage	V	X				
-	Dudhganga	VI					
17	Varahi	VII			X		Sent back in 12/89

ANNEXURE - II (7)

STATUS OF UNAPPROVED PROJECTS
ONGOING MAJOR PROJECTS OF EIGHTH PLAN

SL. NO.	NAME OF PROJECT	STARTED IN PLAN	CLEARED BY TAC	UNDER TECHNICAL EXAMINATION	DELETED FROM CWC LIST	PROJECT REPORT NOT RECEIVED	REMARKS
1	2	3	4	5	6	7	8
KERALA							
18	Idamalayar	VI	X				
MADHYA PRADESH							
19	Mahanadi Res.	IV		X			
-	Rajghat -Unit II	V	X				
20	Bansagar -Unit II	V	X				
21	Bargi	V	X				
22	Thanwar	AP 78-80	X				
-	Bawanthadi	VI					
23	Mahan	VI	X				
MAHARASHTRA							
24	Dudhganga	V		X			Considered by TAC and deferred
25	Bhatse	V	X				
26	Bawanthadi	AP 78-80	X				
27	Tillari	AP 78-80	X				
28	Lendi	VI			X		Sent back in 8/89
29	Lower Wardha	VI			X		Sent back in 11/87
30	Lower Wunna	VI	X				
31	Wan	VI	X				
32	Arunavathi	VI	X				
33	Tultuli	VI		X			
34	Talomba	VI			X		Sent back in 8/89
35	Punad	VI	X				
36	Humman	VI		X			
PUNJAB							
-	S.T.L. Canal	VI	X				
RAJASTHAN							
37	Bisalpur	VII	X				

ANNEXURE - II (7)

STATUS OF UNAPPROVED PROJECTS
ONGOING MAJOR PROJECTS OF EIGHTH PLAN

SL. NO.	NAME OF PROJECT	STARTED IN PLAN	CLEARED BY TAC	UNDER TECHNICAL EXAMINATION	DELETED FROM CWC LIST	PROJECT REPORT NOT RECEIVED	REMARKS
1	2	3	4	5	6	7	8
UTTAR PRADESH							
38	Rajghat Canal	V	X				
39	Kanhar Irrigation	V		X			
40	Bewar Feeder	V	X				
41	Maudaha Dam	V		X			
-	Bansagar -Unit II	V					
42	Chitaurgarh Res.	V		X			
43	Chambal Lift	AP 78-80		X			
44	Tehri	VII	X				
WEST BENGAL							
45	Barrage and Irrigation System of DVC	I			X		
-	Subernarekha	V					
TOTAL :			26	11	7	1	

ANNEXURE - II(8)

**Externally Aided Major & Medium Irrigation Projects
in operation during VIII Plan**

S.NO.	State/Project	Credit No.	Closing Dte.
ANDHRA PRADESH			
1.	A.P.Irrigation-II Project	Cr.1665-in	6/94
	(a) Sriram Sagar		
	(b) Sri Saiaam R.B.C		
GUJARAT			
2.	Sardar Sarovar Dam & Power Project	Cr.1552 in Cr.2497 in	3/93
3.	Sardar Sarovar Water Delivery & Drainage Project	Cr.1553 in	6/92
4.	Gujarat Medium Irrigation II Project	Cr.1496 in	3/94
	(a) Panam		
	(b) Sukhi		
	(c) Sipu		
	(d) Waatrak		
	(e) Sukhbhadar		
	(f) Machhundri		
	(g) Kalubar		
	(h) Machhannela		
	(i) Ver II (Aunli)		
	(j) Deo		
	(k) Venu II		
	(l) Und (Sivapur)		
	(m) Bhadar (PMS)		
	(n) Majan		
	(o) Hadaf		
	(p) Guhai		
	(q) Kelia		
	(r) Aji II		
	(s) Aji III		
	(t) Jhuj		
	(u) Uben		
	(v) Demi		
	(x) Modernnisatrin of Fatehwadi		
	(y) Mod.Dagtuwada		
	(z) Mod.of Bhadar (s)		
	(aa) Mod. of Shetrunji		
	(bb) Mod. of Machu I		
	(cc) Karjan		
	(dd) Salinity uigre4ss		
	(ee) Machu I (Dam Strengthening)		
	(ff) Machu II (Reconstruction)		
	(gg) WALMI		

HARYANA
-----**5. Haryana Water resources
consolidation Projects**

cr.no.2592

12/2000

- (a) Western Jamuna Canal
- (b) Bhakra Canals

KARNATAKA
-----**6. Upper Krishna Irrigation II
Project**Cr.2010-in
Ln.3050-in

12/96

MAHARASHTRA
-----**7. Maharashtra crujosite
Irrigation Project III**

Cr.1621

12/96

- (a) Majalgaon
- (b) Jayakwadi St. II
- (c) Krishna
- (d) Bhima
- (e) Kukadi
- (f) Upper Penganga

ORISSA
-----**8. Orissa Water resources
consolidation projects**

Cr.2801-in

9/2002

(a) SCHEME COMPETIONS;

- 1. Rengali
- 2. Mahanadi-Chitropala
- 3. Nara
- 4. Badanalla
- 5. Harabhang
- 6. Hariharjore
- 7. Upper Jonk
- 8. Baghua

(b) SYSTEM IMPROVEMENTS :

- 1. Mahanadi Delta Stage-I
(Kendrapara Canal)
- 2. Mahanadi Delta Stage-II
(Sakhigopal & Puri Canal)
- 3. Rushikulya System
(Main & 10th Disty)
- 4. Baitarani System
(HLC Range-III)
- 5. Hirakud System
- 6. Janivilli Anicut (50,925 ha.)
- 7. Dadaaraghati
- 8. Pitamahar
- 9. Aunli
- 10. Kalo
- 11. Baldiha
- 12. Jayamangal
- 13. Hiradharbati

14. Ghodahada
15. Pilasalki
16. Bhaskel
17. Uttei
18. Budhabudhiani
19. Rushikulya System
20. Dhanei
21. Salia
22. Derejang
23. Hirakud System
(Paramanpur & Resam Br.)
24. Mahanadi Delta Stage I
(Karandia & Pundal Br.)
25. Salandi System
(Charampa Branch)
26. Mahanadi Delta Stage-II
(Gop & Phulnakhara Br.)

PUNJAB

- | | | |
|---|--------------------------|------|
| 9. Punjab Irrigation & Drainage project | Cr.2076 IN
Cr.3144 IN | 3/98 |
|---|--------------------------|------|

RAJASTHAN

10. Sidhmukh Nahar

TAMIL NADU

- | | | |
|--|------------|--------|
| 11. Periyar Vaigai Irrig.II | Cr.1468 IN | 10/93 |
| 12. Tamilnadu Water Resources Consolidation Project6 | Cr.2745-in | 3/2002 |

UTTAR PRADESH

- | | | |
|--|-------------|------|
| 13. Upper Ganga Irrigation Modernisation Project | Cr. 1483 in | 9/94 |
|--|-------------|------|

WORLD BANK AID (POWER SECTOR)

ORISSA

- | | | | |
|------------------|-------------------------|------------|-------|
| Upprr Indravathi | I.D.A | CR.1356 In | 12/94 |
| | I.B.R.D(Loan)No.2278 in | | 12/94 |

O.E.C.F JAPAN AID

- | | | |
|------------------------------|----------|------|
| Left Canal(Upper Indravathi) | | |
| 14 KM to 52 KM | I D-P-57 | 1/99 |
| Upper Kolab | I.D-P-56 | 7/98 |

European Economic Community(E.E.C) Aid

Rajasthan

Sidhmukh Nahar Project

Cr.No.ALA/91/35

12/2000

Externally Aided Projects Spilling Over to IX Plan

Haryana

1. Haryana W.R.C.P

Karnataka

2.Upper Krishana Irrg.Proj. Stg.II

Orissa

3. Orissa W.R.C.P

Tamilnadu

4. Tamilnadu W.R.C.P

Maharashtra

5.Maharashtra Composite Irrg.Proj. III

Rajasthan

6.Sidhmukh Nahar

Punjab

7.Punjab Irrigation& Drainage Project

T A B L E - 1

A B S T R A C T O F N I N T H P L A N P R O P O S A L S

STATE	RUPEES CRORES / THOUSAND HECTARES																	
	PROJECTS CONSIDERED AS ONGOING						NEW PROJECTS						PROJECTS PROPOSED FOR COMPLETION IN IX PLAN					
	MAJOR			MEDIUM			ERN			MAJOR			MEDIUM			MAJOR		
	NUMBER	SPILL- OVER COST	NUMBER	SPILL- OVER COST	NUMBER	SPILL- OVER COST	NUMBER	SPILL- OVER COST	NUMBER	MAJOR	MEDIUM	ERN	MAJOR	MEDIUM	ERN	MAJOR	MEDIUM	ERN
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18
1 Andhra Pradesh	13	3857	19	324	4	296	12	3	11	14	22	4	-	4246	359	328	4933	4933
2 Arunachal Pradesh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3 Assam	4	174	9	54	-	-	-	6	7	4	9	-	-	199	59	-	258	258
4 Bihar	15	2096	24	211	5	651	7	30	-	11	24	4	6	1742	243	696	2681	2681
5 Goa	1	52	1	38	-	-	-	-	-	1	1	-	-	67	44	-	111	111
6 Gujarat	2	7603	12	135	2	85	1	4	-	1	16	2	9	4244	122	110	4476	4476
7 Haryana	3	115	-	-	2	762	7	-	1	9	-	1	12	1040	-	45	1085	1085
8 Himachal Pradesh	-	-	1	3	-	-	1	5	-	-	1	-	1	-	4	-	4	4
9 Jammu & Kashmir	1	40	5	33	6	52	-	1	2	1	6	8	-	50	42	65	157	157
10 Karnataka	7	2088	11	136	2	478	8	8	-	7	19	2	24	2402	156	549	3107	3107
11 Kerala	2	81	5	96	-	-	2	-	8	4	5	-	22	101	121	-	222	222
12 Madhya Pradesh	16	4469	24	223	4	559	7	20	-	12	44	4	13	2808	276	175	3259	3259
13 Maharashtra	27	4934	43	570	5	40	11	7	-	16	50	5	29	2945	700	46	3691	3691
14 Manipur	2	99	-	-	4	12	-	1	-	2	1	4	-	124	15	-	139	139
15 Meghalaya	-	-	1	6	-	-	-	-	-	-	1	-	-	-	7	-	7	7
16 Mizoram	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Nagaland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Orissa	6	4625	8	308	15	167	6	4	4	4	12	15	16	3635	380	205	4220	4220
19 Punjab	-	222	1	2	1	18	-	-	-	-	1	1	-	282	3	23	308	308
20 Rajasthan	5	1762	4	27	10	381	6	16	-	4	26	10	42	1682	31	438	2151	2151
21 Sikkim	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Tamil Nadu	-	-	-	-	-	-	1	2	-	1	2	-	-	1500	-	-	1500	1500
23 Tripura	-	-	3	13	-	-	-	-	-	-	3	-	-	-	16	-	16	16
24 Uttar Pradesh	13	2325	1	6	4	126	3	14	6	11	1	4	14	2576	7	165	2748	2748
25 West Bengal	2	759	4	7	3	154	6	18	3	2	4	5	17	396	8	16	420	420
Union Territories	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL : 119	35299	176	2192	67	3781	78	139	42	104	248	69	205	30039	2593	2861	35493	35493	35493

TABLE-1
ABSTRACT OF NINTH PLAN PROPOSALS

STATE	O U T L A Y P R O P O S E D										R U P E E S C R O R E S / T H O U S A N D H E C T A R E S			
	NEW PROJECTS	SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS	DAM SAFETY MEASURES	IMPROVED WATER MANAGEMENT	SURVEY AND INVESTIGATION		WATER DEVELOPMENT		TRAINING NATIONAL PROJECT	TOTAL	TOTAL	O U T L A Y AT CONSTANT PRICES	POTENTIAL T A N G E T T E D	
					RESEARCH AND DEVELOPMENT	TRAINING	NATIONAL PROJECT	TOTAL						TOTAL
1	19	20	21	22	23	24	25	26	27	28	29	30		
1 Andhra Pradesh	4485	90	76	140	61	57	37	26	181	9905	8274	827		
2 Arunachal Pradesh	-	-	-	-	2	-	-	-	2	2	2	-		
3 Assam	196	-	-	-	14	3	3	-	20	474	306	84		
4 Bihar	239	83	7	178	65	26	15	-	106	3300	2551	543		
5 Goa	-	-	-	-	1	1	1	-	3	114	93	43		
6 Gujarat	105	37	35	124	29	44	24	26	123	4907	3537	771		
7 Haryana	626	61	-	219	17	13	7	-	37	2040	1434	329		
8 Jharkhand Pradesh	129	-	3	-	1	1	1	-	3	142	107	22		
9 Jammu & Kashmir	70	-	-	8	1	1	1	-	3	238	181	41		
10 Karnataka	3338	41	36	54	13	31	17	25	86	6686	5319	742		
11 Kerala	620	-	10	-	7	1	1	19	28	902	707	237		
12 Madhya Pradesh	275	43	112	95	67	32	18	29	146	4443	3487	1375		
13 Maharashtra	482	61	11	116	33	35	19	41	128	4518	3499	909		
14 Manipur	13	-	-	-	1	1	1	-	3	155	121	47		
15 Meghalaya	-	-	-	-	1	-	-	-	1	8	6	20		
16 Mizoram	-	-	-	-	1	-	-	-	1	1	1	-		
17 Nagaland	-	-	-	-	1	-	-	-	1	1	1	-		
18 Orissa	707	42	128	137	37	29	16	24	106	5356	4166	1037		
19 Punjab	200	71	-	185	9	3	2	-	14	778	449	125		
20 Rajasthan	542	60	82	169	8	22	12	-	42	3088	2269	624		
21 Sikkim	-	-	-	-	-	-	-	-	-	-	-	-		
22 Tamil Nadu	93	46	90	47	-	15	8	29	52	1823	1295	27		
23 Tripura	-	-	-	-	2	-	1	-	3	19	13	23		
24 Uttar Pradesh	746	204	73	310	100	26	13	-	137	4252	2872	1218		
25 West Bengal	384	41	2	157	14	7	4	-	25	1046	675	453		
Union Territories	-	-	-	-	-	-	-	-	-	-	-	-		
TOTAL :	13750	880	645	1939	485	346	201	219	1251	54183	41645	9516		

RUPEES CRORES / THOUSAND HECTARES

TABLE 2

STATEMENT SHOWING OUTLAY FOR ONGOING PROJECTS OF IX PLAN
WITH AND WITHOUT ESCALATION OF LATEST ESTIMATED COST

SL. NO.	NAME OF STATE	PROPOSED OUTLAY FOR ONGOING PROJECTS WITHOUT ESCALATION OF LATEST ESTIMATED COST (LEC)				RUPEES 'CRORES	
		MAJOR MEDIUM		ERM	TOTAL	PROPOSED OUTLAY FOR ONGOING PROJECTS WITH ESCALATION OF LEC	DIFFERENCE OR ADDL. OUTLAY
1	Andhra Pradesh *	4246	359	328	4933	5426	493
2	Arunachal Pradesh *	-	-	-	-	-	-
3	Assam *	199	59	-	258	284	26
4	Bihar *	1742	243	696	2681	2949	268
5	Goa	67	44	-	111	133	22
6	Gujarat	4244	122	110	4476	5371	895
7	Haryana *	1040	-	45	1085	1194	109
8	Himachal Pradesh *	-	4	-	4	5	1
9	Jammu and Kashmir *	50	42	65	157	173	16
10	Karnataka *	2402	156	549	3107	3418	311
11	Kerala	101	121	-	222	267	45
12	Madhya Pradesh *	2808	276	175	3259	3585	326
13	Maharashtra	2945	700	46	3691	4429	738
14	Manipur	124	-	15	139	167	28
15	Meghalaya	-	7	-	7	8	1
16	Mizoram	-	-	-	-	-	-
17	Nagaland	-	-	-	-	-	-
18	Orissa *	3635	380	205	4220	4642	422
19	Punjab	282	3	23	308	370	62
20	Rajasthan	1682	31	438	2151	2581	430
21	Sikkim	-	-	-	-	-	-
22	Tamilnadu	1500	-	-	1500	1800	300
23	Tripura	-	16	-	16	19	3
24	Uttar Pradesh	2576	7	165	2748	3298	550
25	West Bengal	396	8	16	420	504	84
TOTAL :		30039	2578	2876	35493	40623	5130

INDEX :

* Proposals for IX Plan received from these States. Hence LEC for 1997-98 (i.e. at the beginning of IX Plan) and thereby outlay with escalation arrived at by adding 10 % on proposed outlay.

For all other States LEC for 1997-98 and thereby outlay with escalation arrived at by adding 20% on outlay.

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : ANDHRA PRADESH

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	% AGE	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL UPTO END OF VIII PLAN	LIKELY ACHIEVEMENT OF POTENTIAL IN IX PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED	RUPEES CRORES / THOUSAND HECTARES	
															1	2
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
I. LIABILITIES OF COMPLETED PROJECTS																
II. ONGOING PROJECTS																
A. MAJOR PROJECTS																
a. EXTERNALLY-AIDED PROJECTS																
b. INNERSTATE PROJECTS																
c. PRE-FIFTH PLAN PROJECTS																
1. Nagarjunasagar																
2. Sriramsagar Stg. I																
3. Pulivendra Branch Canal																
4. Vamsadhara Stg. I																
Sub-total c :																
d. OTHER PROJECTS																
1. Singur																
2. Somasila																
3. Teluru Reservoir																
TAC DP																
4. Jurala (Priyadarshini)																
5. Srisailem LBC																
6. Srisailem RBC																
7. Surkesula Barrage																
8. Alaganur Balancing Reservoir																
Sub-total d :																
Total A :																
B. MEDIUM PROJECTS																
19. NOs.																
C. ERM SCHEMES																
1. Tungabhadra HLC Stg. II																
2. Godavari Barrage																
3. Improvements to Nizamsagar																

DETAILED PROPOSALS FOR MINTM PLAN (1997-2002)

STATE : ANDHRA PRADESH

STATE : A N D H R A P R A D E S H														
ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE UPTO END OF VIII PLAN DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN		LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL UPTO END OF VIII PLAN	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED
					AMOUNT	% AGE								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	4. Gannavaram Aqueduct:	UA	VIII	15.50	5.50	5.50	352	10.00	10.00	12	-	-	-	IX
	Total C :		678.74	121.25	383.13		295.61	295.61	328	89.62	32.96	36.66	57	
	Total II :		9541.84	2827.46	5065.18		4476.66	4476.66	4953	2149.07	1540.64	588.43	651	
III. NEW PROJECTS														
A. MAJOR PROJECTS														
	1. Vasudhara Stg. II	TAC	710.14	5.00	10.29	12	699.85	699.85	770	23.71	23.71	-	24	IX
	2. Pulichintala	TAC	506.20	2.00	2.00	NEG	504.20	300.00	348	82.15	STABILISATION	-	42	Beyond IX
	3. Bheem Lift	TAC	744.00	1.00	1.00	NEG	743.00	493.00	604	131.50	-	-	-	Beyond IX
	4. Galeru Nagar-i Sujala	UA	2000.00	10.00	10.00	12	1990.00	60.00	65	240.00	-	-	-	Beyond IX
	5. Sravanthi	TAC	697.70	1.35	1.35	NEG	696.35	370.00	450	240.00	-	-	110	Beyond IX
	6. Polavaram	UA	3050.00	1.00	1.00	NEG	3029.00	82.00	90	291.10	-	-	-	Beyond IX
	7. Hundrinneeva Sujala	UA	1478.74	-	-	-	1478.74	45.00	50	242.00	-	-	-	Beyond IX
	8. Flood flow Canal From Foreshore of Sriramsagar	TAC	1331.30	2.00	2.00	NEG	1329.30	766.00	957	NA	-	NA	-	Beyond IX
	9. Velligonda	UA	980.00	-	-	-	980.00	-	-	NA	-	NA	-	Beyond IX
	10. Kalvekurthi	UA	1200.00	-	-	-	1200.00	270.00	300	-	-	-	-	-
	11. Metlupadu - I	UA	370.00	-	-	-	370.00	-	-	-	-	-	-	-
	12. Ichampally	UA	1110.00	-	-	-	1110.00	-	-	-	-	-	-	-
	Sub-total A :		14158.08	22.35	27.64		14130.44	3085.85	3654	-	-	-	176	
B. MEDIUM PROJECTS														
	3. Moa.	UA	132.00	-	1.00	12	131.00	131.00	144	-	-	-	-	IX
C. ERM SCHEMES														
	1. Mod. of Godavari Barrage	UA	1630.00	-	24.37	12	1605.63	100.00	100	NA	-	NA	-	Beyond IX
	2. Mod. of Nagarjunsagar	UA	-	-	-	-	-	-	-	-	-	-	-	Beyond IX
	3. Mod. of Sriramsagar	UA	-	-	-	-	-	-	-	-	-	-	-	Beyond IX
	4. Mod. of Prakasam Barrage	UA	-	-	-	-	-	-	-	-	-	-	-	Beyond IX
	5. Mod. of K.C.Canals	UA	-	-	-	-	-	-	-	-	-	-	-	Beyond IX
	6. Mod. of Tungabhadra LLC	UA	-	-	-	-	-	-	-	-	-	-	-	Beyond IX
	7. Mod. of Tungabhadra HLC Stg. II	UA	-	-	-	-	-	-	-	-	-	-	-	Beyond IX
	8. Mod. of Pennar River Canal	UA	-	-	-	-	-	-	-	-	-	-	-	Beyond IX
	9. Mod. of Rajoli Banda Div.	UA	-	-	-	-	-	-	-	-	-	-	-	Beyond IX

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : ANDHRA PRADESH

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL UPTO END OF VIII PLAN	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	RUPEES CRORES / THOUSAND HECTARES		
												PROPOSED TARGET OF POTENTIAL IN IX PLAN	IN WHICH LIKELY TO BE COMPLETED	PLAN
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	10. Mod. of Krishna Delta	TAC	659.00	-	-	-	659.00	480.00	587	NA	-	NA	-	Beyond IX
	11. Extension of irrigation from 40 - 5/8 ha. block	UA	100.00	-	-	-	100.00							Beyond IX
		Sub-total C :	2389.00	-	24.37	2364.63	580.00	687	-	-	-	-	-	
		Total III :	16679.00	22.35	53.01	16626.07	3796.85	4485	-	-	-	-	176	
	IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS							90						
	V. DAM SAFETY MEASURES							76						
	VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)							140						
	VII. WATER DEVELOPMENT													
	A. SURVEY AND INVESTIGATION							61						
	B. RESEARCH AND DEVELOPMENT							57						
	C. TRAINING							37						
	D. NATIONAL HYDROLOGY PROJECT							26						
		Total VII :						181						
	GRAND TOTAL :		26220.92	2849.81	5118.19	21102.73	8273.51	9905	2149.07	1560.64	588.43	827		

INDEX : UA - Unapproved
TAC - Accepted by TAC
NA - Not Available
DP - Drought Prone Area Project
TSP - Tribal Sub-Plan Project
NEG - Negligible

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : ARUNACHAL PRADESH

ITEM NO.	NAME OF PROJECT	RUPEES CRORES / THOUSAND HECTARES												
		PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY SPILL-OVER COST IN VIII PLAN	AT CONSTANT PRICES	IN PLAN	PROPOSED OUTLAY IN PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE OF POTENTIAL IN PLAN	PROPOSED TARGET IN WHICH LIKELY TO BE COMPLETED IN PLAN	PLAN
1		3	4	5	6	7	8	9	10	11	12	13	14	15
2														
I. LIABILITIES OF COMPLETED PROJECTS														
NIL														
II. ONGOING PROJECTS														
NIL														
III. NEW PROJECTS														
NIL														
IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS														
NIL														
V. DAM SAFETY MEASURES														
NIL														
VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)														
2														
VII. WATER DEVELOPMENT														
A. SURVEY AND INVESTIGATION														
B. RESEARCH AND DEVELOPMENT														
C. TRAINING														
D. NATIONAL HYDROLOGY PROJECT														
Total VII :														
2														
GRAND TOTAL :														
2														

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : A S S A M

RUPEES CRORES / THOUSAND HECTARES

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED C	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	IX PLAN OUTLAY IN IX PLAN	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT UPTO END OF VIII PLAN	LIKELY BALANCE POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
I. LIABILITIES OF COMPLETED PROJECTS															
NIL															
II. ONGOING PROJECTS															
A. MAJOR PROJECTS															
a. EXTERNALLY-AIDED PROJECTS															
NIL															
b. INDIAN PROJECTS															
NIL															
c. PRE-FIFTH PLAN PROJECTS															
NIL															
d. OTHER PROJECTS															
TSP	1. Dimaasri	V	200.00	36.36	118.97	59%	81.03	81.03	94	68.98	20.08	48.98	49	IX	
TSP	2. Integrated Kollong	V	80.55	12.17	41.72	52%	38.83	38.83	42	34.00	29.73	4.27	4	IX	
TSP	3. Bordikerei	V	47.49	6.77	30.59	64%	16.90	16.90	21	25.53	25.53	-	-	IX	
TSP	4. Chimpamati	VI	75.00	14.31	37.69	50%	37.31	37.31	42	24.99	10.00	14.99	15	IX	
Sub-total d :			403.04	69.61	228.97		174.07	174.07	199	153.50	85.26	68.24	68		
B. MEDIAN PROJECTS			163.07	33.73	109.13	67%	53.94	53.94	59	78.25	62.43	15.82	16	IX	
C. ENR SCHEMES															
NIL															
Total II :			566.11	103.34	338.10		228.01	228.01	258	231.75	147.69	84.08	84		
III. NEW PROJECTS															
A. MAJOR PROJECTS															
NIL															
B. MEDIAN PROJECTS															
6 Nos.			240.00	-	-	-	240.80	98.00	122	43.40	-	43.40	-	Beyond IX	
C. ENR SCHEMES			173.00	-	-	-	173.00	60.00	74	61.29	-	61.29	-	Beyond IX	
7 Nos.															
Total III :			413.00	-	-	-	413.00	158.00	196	104.69	-	104.69	-		

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : B I H A R

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE OF VIII PLAN	AGE	% COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL IN IX PLAN	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED	RUPEES CRORES / THOUSAND HECTARES										
															12	13	14	15							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15											
I. LIABILITIES OF COMPLETED PROJECTS																									
A. MAJOR PROJECTS																									
B. MEDIUM PROJECTS																									
C. ERM SCHEMES																									
NIL																									
Total I :																5.44	6								
II. ONGOING PROJECTS																									
A. MAJOR PROJECTS																									
a. EXTERNALLY-AIDED PROJECTS																									
NIL																									
b. INERSTATE PROJECTS																									
1. Bamsagar (Dam share)																									
c. PRE-FIFTH PLAN PROJECTS																									
1. Western Kosi Canal																									
d. OTHER PROJECTS																									
1. North Koel Reservoir																									
2. Ajoy Barrage Siktia																									
3. Durgavathi Reservoir																									
4. Konar Diversion																									
5. Barner Reservoir																									
6. Tilaiya Diversion																									
7. Bateshwarasthan Pump Ph. I																									
8. Bagmati																									
9. Gumati Barrage																									
10. Subarnarekha																									
11. Okranala Pump Ph. I																									
12. Sindhuarni																									
13. Punesi Reservoir																									
14. Auranga Reservoir																									
Sub-total c :																3647.29	371.44	1706.97	1940.32	1358.02	1559	794.55	82.21	712.34	320
Total A :																4144.73	459.61	2049.23	2095.50	1513.20	1742	1029.35	119.91	909.44	470

STATE : B I N A R
D E T A I L E D P R O P O S A L S F O R N I N T H P L A N (1 9 9 7 - 2 0 0 2)

ITEM NO.	NAME OF PROJECT	RUPEES CRORES / THOUSAND HECTARES												
		PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY SPILL-OVER COST IN PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	IX PLAN OUTLAY IN PLAN	PROPOSED OUTLAY IN PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
VII. WATER DEVELOPMENT														
A. SURVEY AND INVESTIGATION														
B. RESEARCH AND DEVELOPMENT														
C. TRAINING														
D. NATIONAL HYDROLOGY PROJECT														
Total VII : 106														
GRAND TOTAL : 6744.08 688.23 2656.99 4087.09 2550.64 3300 1217.38 163.04 1054.34 563														

INDEX : UA - Unapproved
TAC - Accepted by TAC
NA - Not Available
DP - Drought Prone Area Project
TSP - Tribal Sub-Plan Project

STATE : G O A
DETAILED PROPOSALS FOR NINTH PLAN (1 9 9 7 - 2 0 0 2)

RUPEES CRORES / THOUSAND HECTARES														
ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY SPILL-OVER COST IN VIII PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	IX PLAN OUTLAY IN IX PLAN	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL IN VIII PLAN	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE POTENTIAL IN IX PLAN	PROPOSED TARGET IN WHICH LIKELY TO BE COMPLETED IN IX PLAN	PLAN
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
I. LIABILITIES OF COMPLETED PROJECTS														
NIL														
II. ONGOING PROJECTS														
A. MAJOR PROJECTS														
B. EXTERNALLY-AIDED PROJECTS														
NIL														
b. INESTATE PROJECTS														
- Tiliari														
c. PRE-FIFTH PLAN PROJECTS														
NIL														
d. OTHER PROJECTS														
1. Salauli														
UA		AP 78-80	217.22	106.39	175.18	81%	42.04	45.00	52	24.02	-	24.02	20	IX
V			130.50	43.91	119.54	92%	10.06	10.00	15	21.24	8.80	12.44	12	IX
Sub-total A :			347.72	150.30	294.72		52.10	55.00	67	45.26	8.80	36.46	32	
B. MEDIUM PROJECTS														
1 NO.														
C. ERM SCHEMES														
NIL														
Total II :			387.72	150.48	297.09		89.73	93.00	111	56.46	8.80	47.66	43	
III. NEW PROJECTS														
NIL														
IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS														
V. DAM SAFETY MEASURES														
NIL														
VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)														
VII. WATER DEVELOPMENT														
A. SURVEY AND INVESTIGATION														
B. RESEARCH AND DEVELOPMENT														
C. TRAINING														
D. NATIONAL HYDROLOGY PROJECT														
NIL														
Total VII :														
GRAND TOTAL :			387.72	150.48	297.09		89.73	93.00	114	56.46	8.80	47.66	43	
INDEX : UA - Unapproved TAC - Accepted by TAC NA - Not Available DP - Drought Prone Area Project TSP - Tribal Sub-Plan Project														

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : GUJARAT

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE UP TO END OF VIII PLAN	LIKELY EXPENDITURE UP TO END OF VIII PLAN	LIKELY EXPENDITURE UP TO END OF VIII PLAN	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL UP TO END OF VIII PLAN	LIKELY ACHIEVEMENT OF POTENTIAL UP TO END OF VIII PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	PROPOSED TARGET IN NINTH PLAN	PLAN IN WHICH COMPLETED
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B. MEDIUM PROJECTS														
A. NO.														
C. ERM SCHEMES														
NIL														
IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS														
V. DAM SAFETY MEASURES														
VI. IMPROVED WATER MANAGEMENT														
(INCLUDING NATIONAL WATER MANAGEMENT)														
VII. WATER DEVELOPMENT														
A. SURVEY AND INVESTIGATION														
B. RESEARCH AND DEVELOPMENT														
C. TRAINING														
D. NATIONAL HYDROLOGY PROJECT														
Total III :														
			148.50	2.64	5.19	143.31	81.71	105	39.17	-	39.17	15		
Total VII :														
			123											
GRAND TOTAL :														
			11027.60	1677.92	3060.29	7967.31	3537.10	4907	1965.91	78.16	1887.75	771		

INDEX : UA - Unapproved
TAC - Accepted by TAC
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TSP - Tribal Sub-Plan Project

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : M A R Y A N A

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	% AGE	LIKELY SPILL-OVER COST IN VIII PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	IX PLAN OUTLAY IN IX PLAN	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	PROPOSED TARGET IN WHICH LIKELY TO BE COMPLETED IN IX PLAN	RUPEES CRORES / THOUSAND HECTARES	
															IX PLAN	IX PLAN
1		3	4	5	6	7	8	9	10	11	12	13	14	15		
2																
I. LIABILITIES OF COMPLETED PROJECTS																
A. MAJOR PROJECTS																
B. MEDIUM PROJECTS																
C. ERM SCHEMES																
NIL																
Total I :																
11. ONGOING PROJECTS																
A. MAJOR PROJECTS																
a. EXTERNALLY-AIDED PROJECTS																
1. Maryana Water Resources Consolidation Project (including Tajewala)																
DP		VIII	1442.12	715.73	715.73	50%	726.39	726.39	900	57.00	8.00	49.00	49			
DP	III		40.41	3.93	30.45	75%	9.96	9.96	12	81.00	61.00	20.00	20	IX		
TAC DP	V		601.00	66.66	521.28	87%	79.72	79.72	100	-	-	-	-	IX		
Sub-total b :																
			641.41	70.59	551.73		89.68	89.68	112	81.00	61.00	20.00	20			
B. INERSTATE PROJECTS																
C. PRE-FIFTH PLAN PROJECTS																
NIL																
D. OTHER PROJECTS																
1. J.L.M. Lift																
DP	V		190.00	8.73	167.23	88%	22.77	22.19	28	164.00	115.00	49.00	49	IX		
Sub-total A :																
			2273.53	795.05	1434.69		838.84	838.26	1040	302.00	184.80	118.00	118			
B. MEDIUM PROJECTS																
NIL																
C. ERM SCHEMES																
1 NO.																
			84.49	31.70	48.58	57%	35.91	35.91	45	96.00	6.00	90.00	90	IX		
Total II :																
			2358.02	826.75	1483.27		874.75	874.17	1085	398.00	190.00	208.00	208			

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : MARYLAND

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	AGE	CONSTANT PRICES	PROPOSED OUTLAY IN VIII PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE OF POTENTIAL IN VIII PLAN	PROPOSED TARGET OF POTENTIAL TO BE COMPLETED IN VIII PLAN	PLAN	RUPEES CRORES / THOUSAND HECTARES											
														1	2	3	4	5	6	7	8	9	10	11	12
III. NEW PROJECTS																									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15											
A. MAJOR PROJECTS																									
	1. Newet Lift	UA	170.00	-	-	-	170.00	170.00	213	44.00	-	44.00	64	IX											
	2. Gharanda	UA	7.45	-	-	-	7.45	7.45	7	12.00	-	12.00	12	IX											
	3. Jattipur Minor	UA	1.82	-	-	-	1.82	1.82	2	5.00	-	5.00	5	IX											
	4. Lodhup	UA	25.00	-	-	-	25.00	25.00	31	13.00	-	13.00	13	IX											
	5. Natvi	UA	113.00	-	-	-	113.00	113.00	141	47.00	-	47.00	47	IX											
	6. Ambala	UA	120.00	-	-	-	120.00	60.00	75	-	-	-	-	IX											
	7. Development of Shiwalik Mills	UA	50.48	-	-	-	50.48	50.48	7	-	-	-	-	IX											
Sub-total A :			487.75	-	-	-	487.75	427.75	476	121.00	-	121.00	121	Beyond IX											
B. MEDIUM PROJECTS																									
N I L																									
C. ERM SCHEMES																									
1. New Drainage & Flood Control Schemes																									
Total III :			487.75	-	-	-	487.75	547.75	626	121.00	-	121.00	121												
IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS																									
V. DAM SAFETY MEASURES																									
VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)																									
VII. WATER DEVELOPMENT																									
A. SURVEY AND INVESTIGATION																									
B. RESEARCH AND DEVELOPMENT																									
C. TRAINING																									
D. NATIONAL HYDROLOGY PROJECT																									
Total VII :									61																
Total VIII :									219																
Total IX :									17																
Total X :									13																
Total XI :									7																
Total XII :									-																
Total XIII :									-																
Total XIV :									-																
Total XV :									-																
Total XVI :									-																
Total XVII :									-																
Total XVIII :									-																
Total XIX :									-																
Total XX :									-																
Total XXI :									-																
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Total LXXXXXXXV :									-																
Total LXXXXXXXVI :									-																
Total LXXXXXXXVII																									

STATE : HIMACHAL PRADESH
DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : M I N A C H A L P R A D E S H														
ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	% AGE	LIKELY SPILL-OVER COST IN IX PLAN PRICES	IX PLAN OUTLAY AT CONSTANT PRICES	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	PROPOSED TARGET	PLAN IN WHICH LIKELY TO BE COMPLETED
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS														
V. DAM SAFETY MEASURES														
VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)														
VII. WATER DEVELOPMENT														
A. SURVEY AND INVESTIGATION														
B. RESEARCH AND DEVELOPMENT														
C. TRAINING														
D. NATIONAL HYDROLOGY PROJECT														
Total VII :														
GRAND TOTAL :														

INDEX : UA - Unapproved
TAC - Accepted by TAC
MA - Not Available
DP - Drought Prone Area Project
TSP - Tribal Sub-Plan Project

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : J A M M U A N D K A S H M I R

		RUPEES CRORES / THOUSAND HECTARES														
ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE OF VIII PLAN	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	IX PLAN OUTLAY IN IX PLAN	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	PROPOSED TARGET IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
I. LIABILITIES OF COMPLETED PROJECTS																
NIL																
II. ONGOING PROJECTS																
A. MAJOR PROJECTS																
a. EXTERNALLY-AIDED PROJECTS																
NIL																
b. INTERSTATE PROJECTS																
NIL																
c. PRE-FIFTH PLAN PROJECTS																
NIL																
d. OTHER PROJECTS																
UA	1. Ravi Tawi Lift Irrigation Complex	V	144.15	21.41	104.49	72%	39.66	39.66	50	73.54	52.88	20.66	21	IX		
Sub-total A :			144.15	21.41	104.49		39.66	39.66	50	73.54	52.88	20.66	21			
B. MEDIUM PROJECTS																
5 NOS.																
C. ERM SCHEMES																
6 NOS.																
Total II :			311.47	71.69	186.12		125.35	125.33	157	192.95	52.88	140.07	41			
III. NEW PROJECTS																
A. MAJOR PROJECTS																
NIL																
B. MEDIUM PROJECTS																
1 NO.																
C. ERM SCHEMES																
2 NOS.																
Total III :			55.86	-	-		55.86	55.86	70	-	-	-	-			

STATE : J A M M U A N D K A S H M I R
D E T A I L E D P R O P O S A L S F O R N I N T H P L A N (1 9 9 7 - 2 0 0 2)

ITEM NO.	NAME OF PROJECT	RUPEES CRORES / THOUSAND HECTARES													
		PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS															
V. DAM SAFETY MEASURES															
VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)															
VII. WATER DEVELOPMENT															
A. SURVEY AND INVESTIGATION															
B. RESEARCH AND DEVELOPMENT															
C. TRAINING															
D. NATIONAL HYDROLOGY PROJECT															
Total VII : 3															
GRAND TOTAL :		367.33	71.69	194.12	181.21	181.19	238	192.95	52.88	140.07	41				

INDEX : UA - Unapproved
TAC - Accepted by TAC
NA - Not Available
DP - Drought Prone Area Project
TSP - Tribal Sub-Plan Project

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : K A R N A T A K A

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LAT/ST EST. COST	LIKELY EXPENDITURE DURING Viii PLAN	LIKELY EXPENDITURE UPTO END OF Viii PLAN	% AGE	7	8	9	10	11	12	13	14	15	RUPEES CRORES / THOUSAND HECTARES	
																LIKELY ACHIEVE-MENT OF POTENTIAL UPTO END OF Viii PLAN	PROPOSED TARGET IN WHICH LIKELY TO BE COMPLETED IN PLAN
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			
I. LIABILITIES OF COMPLETED PROJECTS																	
A. MAJOR PROJECTS																	
	1. Shadra						8.63	9.00	9								
	2. Tungabhadra Dam & LBC						13.22	13.00	13								
	3. Tungabhadra RB HLC						0.50	0.50	1								
B. MEDIUM PROJECTS																	
	6 MOS.						0.80	0.80	1								
C. ERM SCHEMES																	
	N I L																
Total I :																	
							23.15	23.30	24.00								
II. ONGOING PROJECTS																	
A. MAJOR PROJECTS																	
	a. EXTERNALLY-AIDED PROJECTS																
	1. Upper Krishna Stg. I Ph. II	IV	3427.32	1812.68	2544.79	74%	882.53	883.00	1014	424.94	304.54	120.40	120	IX	IX		
	Ntional Water Management Project		161.47	81.90	114.15	71%	47.32	47.00	54	-	-	-	-	-	-		
	Sub-total a :		3588.79	1894.58	2658.94		929.85	930.00	1068	424.94	304.54	120.40	120				
	b. INNERSTATE PROJECTS																
	- Dudhganga	VI	105.00	9.02	12.15	12%	92.85	93.00	107	19.67	-	19.67	10	IX	IX		
	c. PRE-FIFTH PLAN PROJECTS																
	1. Malaprabha	DP	528.73	168.62	443.84	84%	84.89	85.00	98	218.19	183.61	34.58	35	IX	IX		
	d. OTHER PROJECTS																
	1. Karanja	DP	258.17	80.16	159.24	62%	98.93	99.00	114	35.64	22.58	13.06	13	IX	IX		
	2. Bernithore	DP	82.50	35.32	58.39	71%	24.11	24.00	28	20.24	-	20.24	20	IX	IX		
	3. Nippargi Barrage	TAC DP	418.77	14.17	23.95	6%	394.82	395.00	454	59.69	-	59.69	60	IX	IX		
	4. Varahi	UA	122.50	13.94	17.39	14%	105.11	105.00	121	15.70	-	15.70	13	IX	IX		
	5. Upper Tunga	UA	379.87	22.06	22.06	6%	357.81	358.00	412	94.70	-	94.70	85	IX	IX		
	Sub-total d :		1261.81	165.65	281.03		980.78	981.00	1129	225.97	22.58	203.39	191				
	Sub-total A :		5484.33	2237.87	3395.96		2088.37	2089.00	2402	888.77	510.73	378.04	356				
B. MEDIUM PROJECTS																	
	11 NOS.																
	C. ERM SCHEMES																
	1. Chatrapraba Stg. III	DP	758.15	165.13	300.80	41%	437.35	437.00	503	178.06	40.20	137.86	138	IX	IX		

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE: KANSAS

EMERGENCY / TOLL-FREE HOTLINE

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE UP TO END OF VIII PLAN	LIKELY SPILL-OVER COST IN VIII PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF POTENTIAL UP TO END OF VIII PLAN	LIKELY BALANCE POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2. K.R.S. Modernisation													
	DP	AP 78-80	165.60	95.76	125.34	76%	40.26	40.00	46	-	-	-	-	IX
	Sub-total C :													
			903.75	260.89	426.14		477.61	477.00	549	178.08	40.20	137.86	138	
	Total II :													
			6855.79	2720.09	4153.64		2702.15	2702.00	3107	1127.75	509.47	538.28	516	

III. NEW PROJECTS

A. MAJOR PROJECTS

1. Upper Krishna Stg. II UA
2. Bhim Lift UA
3. Nartandaya UA
4. Singatpur UA
5. Banthal Lift UA
6. Bhims Flow UA
7. Mahadevi UA

1. MEDIUM PROJECTS

STANDARD 100-1

750

3613.69	111.74	111.74	33	3501.95	2500.00	3000	240.00	-	240.00	194	Beyond 11
293.96	-	-	-	293.96	294.00	338	42.50	-	42.50	42	11
3907.65	111.74	111.74	-	3795.91	2794.00	3338	282.50	-	282.50	226	

IV. SPECIAL REPAIRS OF EXISTING

AVC-2000 INVESTIGATION SYSTEMS

V. DAN SAFETY MEASURES

VI. IMPROVED WATER MANAGEMENT

(INCLUDING NATIONAL

WATER DEVELOPMENT

A. SURVEY AND

B. RESEARCH AND DEVELOPMENT

41	
36	
54	
(Additional Rs. 5	
Externally-aided	
13	
31	
17	
25	
	86

INDEX :

UA	-	Unapproved	DP	-	Brought Prone Area Project
TAC	-	Accepted by TAC	TSP	-	Tribal Sub-Plan Project
NA	-	Not Available			

DP - Drought Prone Area Project
TSP - Tribal Sub-Plan Project

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : K E R A L A

RUPEES CRORES / THOUSAND HECTARES														
ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
I. LIABILITIES OF COMPLETED PROJECTS														
A. MAJOR PROJECTS														
	1. Periyar Valley													
	2. Pamba													
	3. Chitturpuzha													
	4. Kuttialadi													
	5. Pazhassi													
	6. Kallada													
	7. Muvattupuzha													
	8. Chimon													
	9. Idamalayar													
								20.00	22					
	TAC													
	B. MEDIUM PROJECTS													
	N I L													
	C. ERM SCHEMES													
	N I L													
Total I :														
								20.00	22					
II. ONGOING PROJECTS														
A. MAJOR PROJECTS														
a. EXTERNALLY-AIDED PROJECTS														
N I L														
b. INNERSTATE PROJECTS														
N I L														
c. PRE-FIFTH PLAN PROJECTS														
	1. Kanhirapuzha	TSP	III	59.78	23.00	31.00	52%	28.78	28.78	36	21.85	21.85	-	IX
d. OTHER PROJECTS														
	1. Kuriyakutty Karappara	UA	VIII	60.18	6.55	8.17	14%	52.01	52.81	65	23.47	23.47	23	IX
Sub-total A :														
				119.96	29.55	39.17		80.79	80.79	101	45.32	21.85	23.47	23
B. MEDIUM PROJECTS														
	5 Nos.			167.21	51.89	71.06	42%	96.15	96.88	121	63.99	63.99	64	IX
C. ERM SCHEMES														
N I L														
Total II :														
				287.17	81.44	110.23		177.67	177.67	222	109.31	21.85	87.46	87

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE: KENTUCKY

STREET LIGHTS / STREET LIGHTS

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE UP TO END OF VIII PLAN	LIKELY EXPENDITURE UP TO END OF VIII PLAN	LIKELY SPILL-OVER COST IN PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	IX PLAN OUTLAY IN	PROPOSED OUTLAY IN PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF UPTO END OF VIII PLAN	LIKELY BALANCE POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
III. NEW PROJECTS														
A. MAJOR PROJECTS														
	1. Beyporepuzha (Chaliyar)	UA	378.00	3.47	4.79	12	373.21	373.21	450	108.04	-	108.04	108	IX
	2. Kakkadavu	UA	98.85	0.13	2.28	22	96.57	96.57	120	41.76	-	41.76	42	IX
	Sub-total A :		476.85	3.60	7.07		469.78	469.78	570	149.80	-	149.80	150	
B. MEDIUM PROJECTS														
C. ERM SCHEMES														
	1. Mod. of Malappuzha	UA												
	2. Mod. of Bengalan	UA												
	3. Mod. of Pothundy	UA												
	4. Mod. of Moyyar	UA												
	5. Mod. of Peechi	UA												
	6. Mod. of Vazhathi	UA												
	7. Mod. of Gayathri	UA												
	8. Mod. of Valayar	UA												
	AP 90-92		NA	37.10	37.94		NA	40.00	50	-	-	-	-	Beyond IX
	Sub-total C :		NA	37.10	37.94		NA	40.80	50	-	-	-	-	
	Total III :		476.85	40.70	45.01		469.78	509.78	620	149.80	-	149.80	150	
IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS														
V. DAM SAFETY MEASURES														
VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)														
VII. WATER DEVELOPMENT														
	A. SURVEY AND INVESTIGATION													
	B. RESEARCH AND DEVELOPMENT													
	C. TRAINING													
	D. NATIONAL HYDROLOGY PROJECT													
	Total VII :													
GRAND TOTAL :			764.02	122.14	155.24		646.72	707.45	902	259.11	21.85	237.26	237	

STATE : MADHYA PRADESH DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

		RUPEES CRORES / THOUSAND HECTARES														
ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	% AGE	LIKELY SPILL-OVER GOST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	IX PLAN OUTLAY IN IX PLAN	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL UPTO END OF VIII PLAN	LIKELY ACHIEVEMENT OF POTENTIAL IN IX PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
I. LIABILITIES OF COMPLETED PROJECTS																
A. MAJOR PROJECTS																
TAC																
1. Thanwar																
- Urmil																
2. Natoli																
3. Tawa																
B. MEDIUM PROJECTS																
10 NOS.																
C. EDM SCHEMES																
NIL																
Total I :								10.62	11.00	13						
II. ONGOING PROJECTS																
A. MAJOR PROJECTS																
a. EXTERNALLY-AIDED PROJECTS																
NIL																
b. INERSTATE PROJECTS																
1. Bansagar																
Unit I																
Unit II																
DP																
TAC																
			936.00	58.82	320.67	34%	615.33	205.00	236	-	-	249.00	206	Beyond IX		
			345.00	37.98	129.50	38%	215.50	216.00	248	-	-	-	-			
DP																
Unit I																
Unit II																
			133.50	21.15	92.83	70%	40.67	41.00	47	-	-	-	-	IX		
			309.21	51.87	98.63	32%	210.58	211.00	243	-	116.88	10.40	106.20	106		
UA																
			161.57	13.30	26.45	16%	135.12	135.00	155	-	29.40	-	29.40	29	IX	
			Sub-total b :	1885.28	183.12	668.08	1217.20	808.00	929	395.00	10.40	384.60	335			
C. PRE-FIFTH PLAN PROJECTS																
1. Mahanadi Reservoir																
IV																
			1223.45	125.70	401.68	33%	821.77	400.00	480	304.90	96.60	208.30	50	Beyond IX		
			IV	185.00	41.01	167.37	90%	17.83	18.00	21	60.90	25.10	35.80	36	IX	
			IV	33.54	9.33	28.85	86%	4.69	5.00	6	72.80	3.90	69.00	69	IX	
			IV	46.38	10.85	32.36	70%	14.02	14.00	16	14.50	8.80	6.50	7	IX	
			IV	56.43	10.85	41.60	74%	14.83	15.00	17	44.90	4.70	40.20	40	IX	
			Sub-total c :	1544.80	197.74	671.86	872.94	452.00	540	498.00	138.20	359.80	202			

STATE : MADHYA PRADESH DETAILED PROPOSALS FOR NINTH PLAN (1997 - 2002)

ITEM NO.		NAME OF PROJECT		PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY FUTURE UPTO END OF VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	AGE	LIKELY SPILL-OVER COST IN PLAN	IX PLAN AT CONSTANT PRICES	IX PLAN OUTLAY IN PLAN	PROPOSED OUTLAY IN PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE POTENTIAL IN PLAN	PROPOSED TARGET OF POTENTIAL IN PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
d. OTHER PROJECTS																		
	1. Bargi (Rani Awanthibai Sagar)	UA	V	742.84	127.57	413.97	56%	328.87	329.00	400	157.00	98.00	59.00	50	36	36	36	Beyond IX
	2. Upper Wainganga		V	176.53	42.59	163.38	93%	13.15	13.00	15	105.30	69.00	36.30	34	1	1	1	IX
	3. Kodar		V	49.83	8.59	31.90	64%	17.93	18.00	21	23.50	23.20	0.30	44	44	44	44	IX
	4. Bariaapur L.B.C.		V	143.00	18.96	53.91	38%	89.09	89.00	102	43.80	-	43.80	26	26	26	26	IX
	5. Mahi		VI	129.70	17.22	45.52	35%	84.18	84.00	97	26.40	-	26.40	200	200	200	200	Beyond IX
	6. Masdeo Bango		AP 78-80	858.31	185.81	567.77	66%	290.54	290.00	334	392.00	165.40	228.60	15	15	15	15	IX
	7. Man	DP	VI	90.00	49.41	70.12	78%	19.88	20.00	23	15.00	-	15.00	10	10	10	10	IX
	8. Jobat		VI	61.88	22.94	32.54	55%	29.14	29.00	34	9.85	-	9.85	20	20	20	20	Beyond IX
	9. Indira Sagar	DP	VI	1574.30	118.73	140.01	9%	1434.29	200.00	230	123.00	-	123.00	20	20	20	20	Beyond IX
	10. Mahan	TAC	VI	103.14	9.87	31.09	30%	72.05	72.00	83	19.70	-	19.70	20	20	20	20	IX
Sub-total d :																		
Total A :																		
B. MEDIUM PROJECTS																		
C. ERM SCHEMES																		
	1. Sindh Ph. II	UA	VI	607.67	67.49	104.80	17%	502.87	100.00	115	162.00	9.00	153.00	15	-	-	-	Beyond IX
	2. Harai ModernisationA	JA	VII	24.80	4.33	4.47	18%	20.33	15.00	18	-	-	-	7	7	7	7	Beyond IX
	3. Sindh - Remova Link	UA	VII	21.70	2.49	6.12	28%	15.58	16.00	19	7.30	-	7.30	-	-	-	-	IX
	4. Chambal Lift	UA	VII	23.96	1.26	4.13	17%	19.83	20.00	23	-	-	-	-	-	-	-	IX
Total C :																		
Total II :																		
III. NEW PROJECTS																		
A. MAJOR PROJECTS																		
	1. Arpa	UA		265.71	0.51	4.01	2%	261.70	262.00	301	85.40	-	85.40	85	-	-	-	IX
	2. Morgra	UA		77.27	-	-	-	77.27	9.00	11	32.60	-	32.60	-	-	-	-	Beyond IX
	3. Kelo	UA		67.60	-	-	-	67.60	9.00	11	34.60	-	34.60	-	-	-	-	Beyond IX
	4. Parmati Rinsi	UA		351.00	-	-	-	351.00	9.00	11	110.90	-	110.90	-	-	-	-	Beyond IX
	5. Upper Tapti Stg. II	UA		303.44	-	-	-	303.44	9.00	11	46.70	-	46.70	-	-	-	-	Beyond IX
	6. Pench Diversion	TAC		184.04	334.00	6.74	4%	177.30	178.00	204	78.50	-	78.50	79	79	79	79	IX
	7. Bargi Diversion	TAC		995.20	-	-	-	995.20	19.00	23	NA	-	-	-	-	-	-	Beyond IX
Sub-total A :																		
Total :																		

STATE : M A D H Y A P R A D E S H D E T A I L E D P R O P O S A L S F O R N I N T H P L A N (1 9 9 7 - 2 0 0 2)

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE UP TO END OF VIII PLAN	LIKELY EXPENDITURE UP TO END OF VIII PLAN	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL UP TO END OF VIII PLAN	LIKELY ACHIEVEMENT OF POTENTIAL IN IX PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	RUPEES CRORES / THOUSAND HECTARES		
												PROPOSED TARGET	IN WHICH LIKELY TO BE COMPLETED	IN IX PLAN
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B. MEDIUM PROJECTS														
20 Nos.														
C. ERM SCHEMES														
NIL														
Total III :														
			202.95	-	-	-	202.95	203.00	203	108.00	-	108.08	108	IX
			2447.21	334.51	10.75	2436.46	698.00	775	496.70	-	496.70	272		
IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS														
V. DAM SAFETY MEASURES														
VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)														
VII. WATER DEVELOPMENT														
A. SURVEY AND INVESTIGATION														
B. RESEARCH AND DEVELOPMENT														
C. TRAINING														
D. NATIONAL HYDROLOGY PROJECT														
Total VII :			146											
GRAND TOTAL :			11213.95	1702.29	3526.92	7697.65	3487.00	4443	2663.45	580.20	2083.25	1375		

INDEX : UA - Unapproved
TAC - Accepted by TAC
NA - Not Available
DP - Drought Prone Area Project
TSP - Tribal Sub-Plan Project

DETAILED PROPOSALS FOR NINTH PLAN (1997 - 2002)

STATE : M A H A R A S H T R A

RUPEES CRORES / THOUSAND HECTARES

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY SPILL-OVER COST IN VIII PLAN	IX PLAN AT CONSTANT PRICES	IX PLAN OUTLAY IN PLAN	PROPOSED IRRIGATION POTENTIAL IN PLAN	ULTIMATE IRRIGATION POTENTIAL IN PLAN	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	PROPOSED TARGET IN WHICH LIKELY TO BE COMPLETED	PLAN IN WHICH LIKELY TO BE COMPLETED
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2.	Waghur	V	80.00	25.05	31.22	39%	48.78	49.00	56	23.58	-	23.58	24	IX
3.	Upper Pravara	DP	234.00	18.11	28.56	12%	205.44	205.44	256	66.90	-	66.90	60	IX
4.	Chaskaman	DP	174.00	53.20	90.82	52%	83.18	83.00	95	38.62	-	38.62	39	IX
5.	Wandur Madhmeshwar	V	110.00	43.48	53.57	49%	56.43	57.00	66	45.12	1.00	44.12	44	IX
6.	Bhatasa	TSP	240.00	23.33	58.10	24%	181.90	60.80	69	42.15	9.28	32.87	33	IX
7.	Surya	TSP	145.00	48.80	138.35	95%	6.65	7.00	8	27.19	21.92	5.27	5	IX
8.	Ishtapuri (Vishnupuri)	AP 78-80	197.00	36.58	118.52	60%	78.48	78.00	90	33.73	17.41	16.32	16	IX
9.	Ghosikhurd	VI	1345.00	158.49	176.81	13%	1168.19	400.00	500	190.00	2.00	188.00	40	Beyond IX
10.	Man	VI	135.00	97.46	120.03	89%	14.97	15.00	17	17.56	1.00	16.56	5	IX
11.	Punad	TAC DP TSP	62.00	4.90	7.01	11%	54.09	20.00	23	16.86	-	16.86	5	Beyond IX
12.	Humen	VI	69.57	0.12	4.79	7%	64.78	40.00	46	36.22	2.50	33.72	10	Beyond IX
13.	Bembala	UA	228.00	14.35	14.35	6%	213.65	10.80	12	NA	-	-	-	Beyond IX
14.	Bhima Ashkede	UA	113.00	22.50	22.50	20%	90.50	10.00	12	NA	-	-	-	Beyond IX
15.	Jamai Shirani	UA	57.00	5.00	5.00	9%	52.00	15.00	17	NA	-	-	-	Beyond IX
16.	Sina Kolegaon	UA	95.00	8.27	8.27	9%	86.73	10.00	12	73.26	-	13.26	-	Beyond IX
Sub-total d :			3741.57	731.44	1220.48		2521.09	1173.44	1410	631.44	83.58	547.86	333	
Sub-total A :			8909.57	1704.41	3978.88		4930.69	2486.44	2945	1644.38	731.52	912.86	640	
B. MEDIUM PROJECTS														
43 NOS.														
C. ERM SCHEMES														
1.	Strengthening Radhanagri Dam	UA	1164.27	434.74	594.03	51%	570.24	570.00	700	229.00	17.35	211.65	211	IX
2.	Extension of Krishna Canal	UA	9.45	1.35	3.01	32%	6.44	6.00	7	-	-	-	-	IX
3.	Gated Weir at Khodashi	VI	4.30	1.71	4.99	95%	0.21	1.00	1	-	-	-	-	IX
4.	Sangola Branch Canal	VI	44.00	9.95	14.84	34%	29.16	29.00	33	-	-	-	-	IX
5.	Strengthening Ekrak Dam	VI	1.36	0.05	0.17	13%	1.19	1.00	1	-	-	-	-	IX
Sub-total C :			68.68	13.86	28.65		40.03	40.00	46	-	-	-	-	
Total II :			10142.52	2153.01	4601.56		5540.96	3096.44	3691	1873.38	748.87	1124.51	851	

III. NEW PROJECTS

A. MAJOR PROJECTS

1.	Lendi	UA	187.00	5.29	7.91	4%	179.09	25.00	29	19.58	-	19.58	5	Beyond IX
2.	Lower Wardha	UA	232.00	3.40	8.02	3%	223.98	25.00	29	52.98	-	52.98	10	Beyond IX

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : H A N A R A S H T R A

RUPES CRORES / THOUSAND HECTARES

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL UPTO END OF VIII PLAN	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	3. Tultuli	UA	82.94	0.12	3.67	43	79.27	20.00	23	30.39	-	30.39	5	Beyond IX
	4. Telamba	UA	176.00	1.20	8.00	52	168.00	20.00	23	16.75	-	16.75	5	Beyond IX
	5. Lower Budhna	UA	192.00	4.33	5.10	32	186.80	50.00	58	29.80	-	29.80	5	Beyond IX
	6. Lower Penganga	UA	207.14	0.11	0.14	ME6	207.00	50.00	58	135.57	-	135.57	5	Beyond IX
	7. Nira Beaghar	UA	326.00	8.25	8.56	32	317.44	15.00	58	31.21	-	31.21	5	Beyond IX
	8. Khudsh Purna	UA	127.00	-	-	ME6	127.00	5.00	6	NA	-	-	5	Beyond IX
	9. Gunjwani	UA	110.00	0.50	0.50	ME6	109.50	5.00	6	NA	-	-	5	Beyond IX
	10. Bina Nadma Lift	UA	54.59	-	-	ME6	54.59	5.00	6	NA	-	-	5	Beyond IX
	11. Tenghar	UA	85.00	2.00	2.00	22	83.00	5.00	6	NA	-	-	5	Beyond IX
Sub-total A :			1779.67	25.20	43.90		1735.77	225.00	302	316.28	-	316.28	28	
B. MEDIUM PROJECTS														
7 Nos.														
C. ERM SCHEMES														
NIL														
VIII			158.25	3.17	5.33	32	152.92	153.00	180	NA	-	NA	30	IX
Total III :			1957.92	28.37	49.23		1888.69	378.00	482	316.28	-	316.28	58	
IV. SPECIAL REPAIRS OF EXISTING														
IRRIGATION SYSTEMS														
V. DAM SAFETY MEASURES														
VI. IMPROVED WATER MANAGEMENT														
(INCLUDING NATIONAL WATER MANAGEMENT)														
VII. WATER DEVELOPMENT														
A. SURVEY AND INVESTIGATION														
B. RESEARCH AND DEVELOPMENT														
C. TRAINING														
D. NATIONAL HYDROLOGY PROJECT														
Total VII :								61						
								11						
								116						
								33						
								35						
								19						
								41						
Total VII :									128					
GRAND TOTAL :			12080.44	2181.38	4650.79		7429.65	3499.44	4518	2189.66	748.87	1440.79	909	

INDEX : UA - Unapproved
TAC - Accepted by TAC
NA - Not Available
DP - Drought Prone Area Project
TSP - Tribal Sub-Plan Project
MES - Negligible

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : M A N I P U R

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	IX PLAN OUTLAY IN IX PLAN	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)														
VII. WATER DEVELOPMENT														
A. SURVEY AND INVESTIGATION														
B. RESEARCH AND DEVELOPMENT														
C. TRAINING														
D. NATIONAL HYDROLOGY PROJECT														
Total VII :														
GRAND TOTAL :														

INDEX : UA - Unapproved
TAC - Accepted by TAC
NA - Not Available
DP - Drought Prone Area Project
TSP - Tribal Sub-Plan Project

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

RUPEES CRORES / THOUSAND HECTARES														
ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UP TO END OF VIII PLAN	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
I. LIABILITIES OF COMPLETED PROJECTS														
NIL														
II. ONGOING PROJECTS														
NIL														
III. NEW PROJECTS														
NIL														
IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS														
NIL														
V. DAM SAFETY MEASURES														
NIL														
VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)														
NIL														
VII. WATER DEVELOPMENT														
A. SURVEY AND INVESTIGATION														
1														
B. RESEARCH AND DEVELOPMENT														
NIL														
C. TRAINING														
NIL														
D. NATIONAL HYDROLOGY PROJECT														
NIL														
Total VII :													1	
GRAND TOTAL :													1	

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : M A G A L A N D

ITEM NO.	NAME OF PROJECT	RUPEES CRORES / THOUSAND HECTARES													
		PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	IX PLAN OUTLAY IN PLAN	PROPOSED OUTLAY IN PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	PROPOSED TARGET IN WHICH LIKELY TO BE COMPLETED	PLAN	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
I. LIABILITIES OF COMPLETED PROJECTS															
NIL															
II. ONGOING PROJECTS															
NIL															
III. NEW PROJECTS															
NIL															
IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS															
NIL															
V. DAM SAFETY MEASURES															
NIL															
VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)															
NIL															
VII. WATER DEVELOPMENT															
A. SURVEY AND INVESTIGATION															1
B. RESEARCH AND DEVELOPMENT															NIL
C. TRAINING															NIL
D. NATIONAL HYDROLOGY PROJECT															NIL
Total VII :														1	
GRAND TOTAL :														1	

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : O R I S S A

NAME OF PROJECT		PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE UP TO END OF VIII PLAN	LIKELY SPILL-OVER COST IN VIII PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL UP TO END OF VIII PLAN	LIKELY ACHIEVEMENT OF POTENTIAL IN IX PLAN	LIKELY BALANCE POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED		
2		3	4	5	6	7	8	9	10	11	12	13	14	15
C. ERM SCHEMES 15 Nos.														
		Total II :	6668.86	861.93	1569.00	10X	166.81	166.81	205	-	-	-	-	IX
III. NEW PROJECTS														
A. MAJOR PROJECTS														
1. Ong Dam (Chiruli)	UA	TSP	338.00	-	2.42	1X	327.58	80.00	100	34.90	-	34.90	-	Beyond IX
2. Lower Indra	UA DP		338.90	-	1.08	MEG	327.82	170.00	200	32.89	-	32.89	-	Beyond IX
3. Lower Suktel	UA DP		291.58	-	0.48	MEG	291.08	00.80	180	34.05	-	34.05	-	Beyond IX
4. Ib	UA	TSP	1400.00	-	0.39	MEG	1399.61	170.00	200	152.60	-	152.60	-	Beyond IX
5. Samsot	UA		266.00	-	1.48	1X	264.52	40.00	80	32.67	-	32.67	-	Beyond IX
6. Nera	UA		125.75	1.57	1.57	1X	124.18	40.00	50	-	No Direct Benefits	-	-	Beyond IX
Sub-total A :			2742.15	1.57	7.42		2734.73	580.00	700	287.11	-	287.11	-	
B. MEDIUM PROJECTS 4 Nos.														
			191.12	11.36	11.36	6X	179.76	3.88	4				30	IX
C. ERM SCHEMES 4 Nos.														
			3.59	0.77	0.77	21X	2.82	2.82	3				10	IX
Total III :			2936.86	13.70	19.55		2917.31	585.82	707	287.11	-	287.11	40	
IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS														
V. DAM SAFETY MEASURES														
VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)														
VII. WATER DEVELOPMENT														
A. SURVEY AND INVESTIGATION									42					
B. RESEARCH AND DEVELOPMENT									128					
C. TRAINING									137					
B. NATIONAL HYDROLOGY PROJECT									37					
									29					
									16					
									24					
Total VII :									106					
GRAND TOTAL :			9605.72	875.63	1588.55		8017.17	6166.23	5356	1416.12	135.95	1280.17	1051	

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : P U N J A B

RUPEES CRORES / THOUSAND HECTARES

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	IX PLAN OUTLAY IN IX PLAN	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF UPTO END OF VIII PLAN	LIKELY BALANCE POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
I. LIABILITIES OF COMPLETED PROJECTS														
II. ONGOING PROJECTS														
A. MAJOR PROJECTS														
a. EXTERNALLY-AIDED PROJECTS														
1. Punjab Irrigation & Drainage Project														
b. INDIAN STATE PROJECTS														
- SYL Canal														
UA														
(a) Carrier Canal														
(b) Providing Irrigation to Punjab Area														
Sub-total SYL Canal :														
Sub-total a :														
Sub-total b :														
c. PRE-FIFTH PLAN PROJECTS														
NIL														
d. OTHER PROJECTS														
NIL														
Sub-total A :														
B. MEDIUM PROJECTS														
1 NO.														
C. ERM SCHEMES														
1 NO.														
Sub-total VII :														
Sub-total VIII :														
Sub-total IX :														
Sub-total X :														
Sub-total XI :														
Sub-total XII :														
Sub-total XIII :														
Sub-total XIV :														
Sub-total XV :														
Sub-total XVI :														
Sub-total XVII :														
Sub-total XVIII :														
Sub-total XIX :														
Sub-total XX :														
Sub-total XXI :														
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DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : P U N J A B

RUPEES CRORES / THOUSAND HECTARES

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	AGE	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	IX PLAN OUTLAY IN IX PLAN	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS															
V. DAM SAFETY MEASURES															
VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)															
VII. WATER DEVELOPMENT															
A. SURVEY AND INVESTIGATION															
B. RESEARCH AND DEVELOPMENT															
C. TRAINING															
D. NATIONAL HYDROLOGY PROJECT															
Total VII :										14					
GRAND TOTAL :			1101.95	267.74	852.85		249.10	449.14	778	186.06	58.56	127.50	125		

INDEX : UA - Unapproved
TAC - Accepted by TAC
NA - Not Available
DP - Drought Prone Area Project
TSP - Tribal Sub-Plan Project

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : RAJASTHAN

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY SPILL-OVER COST IN VIII PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	PROPOSED OUTLAY IN VIII PLAN	ULTIMATE IRRIGATION POTENTIAL UPTO END OF VIII PLAN	LIKELY ACHIEVEMENT OF POTENTIAL IN VIII PLAN	LIKELY BALANCE POTENTIAL IN VIII PLAN	PROPOSED TARGET IN VIII PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED	RUPEES CRORES / THOUSAND HECTARES		
														1	2	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
I. LIABILITIES OF COMPLETED PROJECTS																
A. MAJOR PROJECTS																
	1. Indira Gandhi Nahar Stg.	DP						26.25	30							
	2. Narisachandra Sagar	DP						NEG	5							
	3. LGIC Works of Chambal Projects							4.50	1							
	4. Jakhm							1.00	1							
B. MEDIUM PROJECTS																
	7 NOS.							4.78	6							
C. ERM SCHEMES																
NIL																
Total I :																
36.53 42																
II. ONGOING PROJECTS																
A. MAJOR PROJECTS																
a. EXTERNALLY-AIDED PROJECTS																
	1. Sidhmukh Mohar	DP	AP 90-92	229.20	181.21	188.52	82%	40.68	41.00	47	67.36	-	67.36	67	IX	
	Sub-total a :			229.20	181.21	188.52		40.68	41.00	47	67.36	-	67.36	67		
b. INTERSTATE PROJECTS																
	- Gurgaon Canal	DP	III	35.40	5.84	25.24	71%	10.16	10.00	12	28.20	22.77	5.43	5	IX	
	1. Mahi Bajaj Sagar	DP	IV	383.63	137.50	366.62	96%	17.01	17.00	21	-	-	-	-	IX	
	2. Narmada Canal	DP	VII	548.00	103.71	107.09	20%	440.91	440.00	506	73.16	-	73.16	-	Beyond IX	
	Sub-total b :			967.03	247.05	498.95		468.98	467.00	539	101.36	22.77	78.59	5		
c. PRE-FIFTH PLAN PROJECTS																
NIL																
d. OTHER PROJECTS																
	1. Indira Gandhi Nahar Stg. II	DP	V	2463.00	722.12	1313.75	53%	1149.25	750.00	975	950.00	457.54	492.46	320	Beyond IX	
	2. Son Kamla Amba	DP	V	178.81	95.62	167.30	94%	11.51	12.00	14	18.79	18.79	-	-	IX	
	3. Bilsalpur	TAC	VII	186.92	62.14	94.61	51%	92.31	92.00	107	49.90	-	49.90	50	IX	
	Sub-total d :			2828.73	879.88	1575.66		1253.07	854.00	1096	1018.69	476.33	542.36	370		
	Sub-total A :			4024.96	1308.14	2263.13		1761.83	1362.00	1682	1187.41	499.10	688.31	442		
B. MEDIUM PROJECTS																
4 NOS.																
				155.26	76.48	128.52	83%	26.74	27.00	31	31.01	11.10	19.91	20	IX	

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : R A J A S T H A N

RUPEES CRORES / THOUSAND HECTARES.

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	AMOUNT	% AGE	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL UPTO END OF VIII PLAN	LIKELY ACHIEVEMENT OF POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
C. ERM SCHEMES 10 Nos.														
			469.18	34.55	88.47	19%	380.71	381.00	438		22.01	9.16	12.85	13
Total II :			469.40	1419.17	2480.12		2169.28	1770.00	2151		1240.43	519.36	721.07	475
III. NEW PROJECTS														
A. MAJOR PROJECTS														
	1. Yamuna	UA	386.00	-	-	-	386.00	100.00	115		NA	-	NA	-
	2. Gegrin	UA	20.00	-	-	-	20.00	20.00	25		10.93	-	10.93	11
	3. Mandhar Thana	UA	78.10	-	-	-	78.10	16.00	20		37.97	-	37.97	8
	4. Indira Lift	UA	184.00	-	-	-	184.00	37.00	46		74.07	-	74.07	15
	5. Pipalda Lift	UA	17.77	-	-	-	17.77	18.00	23		14.87	-	14.87	15
	6. Bholpur Lift	UA	19.90	-	-	-	19.90	20.00	25		24.16	-	24.16	24
Sub-total A :			705.77	-	-	-	705.77	211.00	254		162.00	-	162.00	73
B. MEDIUM PROJECTS 16 Nos.														
			263.05	12.00	12.00	5%	251.05	251.00	288		75.86	-	75.86	76
Total III :			968.82	12.00	12.00		956.82	462.00	542		237.86	-	237.86	149
IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS														
									60					
V. DAM SAFETY MEASURES														
									82					
VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)														
									169					
VII. WATER DEVELOPMENT														
									8					
									22					
									12					
Total VII :									42					
GRAND TOTAL :			5618.22	1431.17	2492.12		3126.10	2268.53	3088		1478.29	519.36	958.93	634
INDEX : UA - Unapproved DP - Drought Prone Area Project TAC - Accepted by TSP - Tribal Sub-Plan Project NA - Not Available														

DETAILED PROPOSALS FOR NINTH PLAN (1997 - 2002)

STATE : TAMILNADU

ITEM NO.	NAME OF PROJECT	RUPEES CRORES / THOUSAND HECTARES													
		PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UP TO END OF VIII PLAN	LIKELY EXPENDITURE UP TO END OF VIII PLAN	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	IX PLAN OUTLAY IN IX PLAN	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL IN IX PLAN	LIKELY ACHIEVEMENT OF POTENTIAL UP TO END OF VIII PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
I. LIABILITIES OF COMPLETED PROJECTS															
NIL															
II. ONGOING PROJECTS															
A. MAJOR PROJECTS															
a. EXTERNALLY-AIDED PROJECTS															
1. Tamilnadu Water Resources Consolidation Project															
			1259.70	-	39.70	3%	1220.00	1220.00	1500	-	-	-	-	-	
b. INNERSTATE PROJECTS															
NIL															
c. PRE-FIFTH PLAN PROJECTS															
NIL															
d. OTHER PROJECTS															
NIL															
Total A :			1259.70	-	39.70		1220.00	1220.00	1500	-	-	-	-	-	
B. MEDIUM PROJECTS															
NIL															
C. ERM SCHEMES															
NIL															
Total II :			1259.70	-	39.70		1220.00	1220.00	1500	-	-	-	-	-	
III. NEW PROJECTS															
A. MAJOR PROJECTS															
1. Anamalaiyar UA															
			50.00	3.00	3.00	6%	47.00	47.00	58	NA	-	MS	20	IX	
B. MEDIUM PROJECTS															
2 NOS.															
			51.47	21.32	23.33	45%	28.14	28.14	35	6.49	-	6.49	7	IX	

DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : TAMILNADU

RUPEES CRORES / THOUSAND HECTARES

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED
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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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C. ERM SCHEMES

NIL

Total III : 101.47 24.32 26.33 75.14 75.14 93 6.49 - 6.49 27

IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS

V. DAM SAFETY MEASURES

VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)

VII. WATER DEVELOPMENT

A. SURVEY AND INVESTIGATION

B. RESEARCH AND DEVELOPMENT

C. TRAINING

D. NATIONAL HYDROLOGY PROJECT

Total VII : 52

GRAND TOTAL : 1361.17 24.32 66.03 1295.14 1295.14 1828 6.49 - 6.49 27

INDEX : UA - Unapproved
TAC - Accepted by TAC
NA - Not Available
DP - Drought Prone Area Project
TSP - Tribal Sub-Plan Project

STATE : T R I P U R A

DETAILED PROPOSALS FOR NINTH PLAN (1997 - 2002)

RUPEES CRORES / THOUSAND HECTARES

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY FUTURE UPTO END OF VIII PLAN	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	IX PLAN OUTLAY IN	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	PROPOSED TARGET IN WHICH LIKELY TO BE COMPLETED IN IX PLAN
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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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I. LIABILITIES OF COMPLETED PROJECTS
NIL

II. ONGOING PROJECTS

- A. MAJOR PROJECTS
NIL
- B. MEDIUM PROJECTS
3 NOS.
- C. ERM SCHEMES
NIL

IX

Total II :	105.59	29.11	93.00	88%	12.59	12.59	16	25.52	2.50	23.02	23	IX
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III. NEW PROJECTS

NIL

- IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS
- V. DAM SAFETY MEASURES
- VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)
- VII. WATER DEVELOPMENT
 - A. SURVEY AND INVESTIGATION
 - B. RESEARCH AND DEVELOPMENT
 - C. TRAINING
 - D. NATIONAL HYDROLOGY PROJECT

NIL
NIL
NIL
2
1
.

Total VII :	105.59	29.11	93.00	12.59	12.59	19	25.52	2.50	23.02	23
GRAND TOTAL :	105.59	29.11	93.00	12.59	12.59	19	25.52	2.50	23.02	23

- INDEX : UA - Unapproved
TAC - Accepted by TAC
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DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : UTTAR PRADESH

RUPEES CRORES / THOUSAND HECTARES

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	AMOUNT	% AGE	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	IX PLAN OUTLAY IN IX PLAN	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF IRRIGATION UPTO END OF VIII PLAN	LIKELY BALANCE POTENTIAL IN IX PLAN	PROPOSED TARGET IN WHICH LIKELY TO BE COMPLETED
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
G. PRE-FIFTH PLAN PROJECTS															
	1. Sarda Sahayak	III	1064.60	202.66	939.68	88%	124.92	124.92	124.92	156	1582.00	1100.26	401.74	402	IX
d. OTHER PROJECTS															
	1. Madhya Ganga Canal	V	508.00	174.45	452.71	89%	53.37	53.37	53.37	67	178.00	138.32	39.68	40	IX
	2. Sarju Nohar	V	1256.00	187.57	517.49	41%	738.51	740.00	740.00	851	1404.00	136.50	1267.50	300	IX
	3. Sonb Pump Canal	V	72.55	19.47	50.26	69%	22.29	22.29	22.29	28	65.06	30.00	35.06	38	IX
	4. Eastern Ganga Canal	V	508.77	91.43	233.43	76%	75.34	75.34	75.34	94	105.00	89.67	15.33	15	IX
	5. Gyanpur Pump Canal	V	111.87	28.38	83.90	75%	27.97	27.97	27.97	35	65.42	41.00	24.42	24	IX
	6. Lakshar Vyas Dam	V	369.00	45.44	165.71	45%	203.29	203.00	203.00	233	-	-	-	-	IX
	7. Jaserani Dam	V	194.00	24.88	24.88	12%	169.92	169.92	169.92	214	60.60	21.00	39.00	40	IX
	8. Tehri Dam	AP 78-80	581.58	184.47	184.47	32%	397.11	397.11	397.11	440	-	-	-	-	Beyond IX
	9. Kanhar Irrigation	UA	174.27	5.92	40.17	23%	134.10	130.10	130.10	168	33.13	39.13	-	33	Beyond IX
	10. Chahal Lift	UA	47.00	28.80	44.99	96%	2.01	2.01	2.01	3	55.42	55.42	-	55	IX
	11. Jerauli Pump Canal	UA	27.54	6.47	7.69	28%	18.85	19.85	19.85	25	17.21	-	17.21	17	IX
B. MEDIUM PROJECTS															
	1 NO.		15.53	6.95	9.72	63%	5.81	5.81	5.81	7	8.50	2.50	6.00	6	IX
C. ERM SCHEMES															
	1. Modernisation of Upper Ganga Canal	UA	705.89	386.05	673.25	95%	32.64	32.64	32.64	41	9.00	9.00	-	-	IX
	2. Lining of Channels	UA	48.78	0.36	7.39	15%	41.39	41.39	41.39	52	24.48	24.48	6.42	18	IX
	3. Modernisation of Agra Canal	UA	36.89	9.24	26.57	72%	10.32	10.32	10.32	20	64.00	5.00	-	59	IX
	4. Modernisation of Lucknow Headworks	UA	44.68	-	2.86	6%	41.82	41.82	41.82	52	-	-	-	-	IX
	Sub-total C :		836.24	395.65	710.07		126.17	126.17	126.17	165	97.48	38.48	6.42	77	
	Total II :		6304.22	1580.70	3847.46		2456.76	2259.76	2748	3821.95	1766.28	2003.00	1195		

STATE : U T T A R P R A D E S H D E T A I L E D P R O P O S A L S F O R N I N T H P L A N (1 9 9 7 - 2 0 0 2)

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	RUPEES CRORES / THOUSAND HECTARES			PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED
												12	13	14		15
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
III. NEW PROJECTS																
A. MAJOR PROJECTS																
	1. Kishau Dam	UA	498.14	3.55	10.20	2x	487.94	400.00	500	-	-	-	-	-	-	Beyond IX
	2. Kachnanda	UA	18.97	-	-	-	18.97	1.00	1	-	-	-	-	-	-	Beyond IX
	3. Pechniad Dam	UA	1074.12	-	-	-	1074.12	10.80	10	-	-	-	-	-	-	Beyond IX
	Sub-total A :		1591.23	3.55	10.20		1581.03	411.00	511	-	-	-	-	-	-	
B. MEDIUM PROJECTS																
	14 NOs.		137.55	-	-	-	137.55	137.55	172	36.80	-	36.80	20			Beyond IX
C. ERM SCHEMES																
	6 NOs.		129.25	-	-	-	129.25	50.00	63	11.80	-	11.00	5			Beyond IX
	Total III :		1858.03	3.55	10.20		1847.83	598.55	746	47.80	-	47.80	25			
IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS																
V. DAM SAFETY MEASURES																
VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)																
VII. WATER DEVELOPMENT																
A. SURVEY AND INVESTIGATION																
B. RESEARCH AND DEVELOPMENT																
C. TRAINING																
D. NATIONAL HYDROLOGY PROJECT																
									204							
									73							
									310							
									100							
									24							
									13							
									-							
	Total VII :									137						
	GRAND TOTAL :		8162.25	1584.25	3857.66		4304.59	2872.31	4232	3869.75	1766.28	2050.89	1218			

INDEX :
UA - Unapproved
TAC - Accepted by TAC
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STATE : WEST BENGAL		DETAILED PROPOSALS FOR NINTH PLAN (1997 - 2002)															AMENDURE - III (1)							
ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	2 AGE	1X PLAN COST IN 1X PLAN	1X PLAN OUTLAY AT CONSTANT PRICES	1X PLAN OUTLAY IN 1X PLAN	PROPOSED IRRIGATION POTENTIAL IN 1X PLAN	ULTIMATE IRRIGATION POTENTIAL UPTO END OF VIII PLAN	LIKELY ACHIEVEMENT OF POTENTIAL IN 1X PLAN	LIKELY BALANCE OF POTENTIAL IN 1X PLAN	PROPOSED TARGET IN 1X PLAN	PLANNED IN UNION LIKELY TO BE COMPLETED	RUPEES CRORES / THOUSAND HECTARES								
																1	2	3						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15										
I. LIABILITIES OF COMPLETED PROJECTS																								
A. MAJOR PROJECTS																								
	1. Barrage and Irrigation System of DVC	UA						10.00	10															
B. MEDIUM PROJECTS																								
	12 NOS.							7.00	7															
C. ERM SCHEMES																								
	NIL																							
Total I :																		17.00	17					
II. ONGOING PROJECTS																								
A. MAJOR PROJECTS																								
a. EXTERNALLY-AIDED PROJECTS																								
	NIL																							
b. INNERSTATE PROJECTS																								
	NIL																							
c. PRE-FIFTH PLAN PROJECTS																								
	1. Kangsabati		205.41	44.44	185.41	90%	20.00	20.00	25	401.66	398.41	3.25	3	IX										
d. OTHER PROJECTS																								
	1. Teesta Barrage	V	980.00	313.73	678.13	69%	301.87	302.00	371	533.52	195.68	337.84	338	IX										
	Sub-stg. I of Stg. III																							
	Sub-total A :		1185.41	358.17	863.54		321.87	322.00	396	935.18	594.09	341.09	341											
B. MEDIUM PROJECTS																								
	4 NOS.																							
C. ERM SCHEMES																								
	1. Mod. of Mayurakshi	UA	32.51	20.77	25.73	79%	6.78	6.78	8	37.66	34.43	3.23	3	IX										
	2. Mod. of Barrage & DVC	UA	60.00	0.02	3.66	6%	56.34	5.00	5	-	-	-	-	IX										
	3. Extension of Bandhu Irrigation	UA	100.00	0.34	3.39	3%	96.61	10.00	10	-	-	-	-	IX										
			5.42	3.08	4.67	86%	0.75	0.75	1	-	-	-	-	IX										
	Sub-total C :		165.42	3.44	11.72		153.70	15.75	16	-	-	-	-											
	Total II :		1383.34	382.38	900.99		482.35	344.53	420	972.84	628.52	344.32	344											
III. NEW PROJECTS																								
A. MAJOR PROJECTS																								
	1. Darakeshwa	UA	120.00	-	0.03	MEG	119.97	25.00	30	45.00	-	45.00	15	Beyond IX										

STATE : WEST BENGAL DETAILED PROPOSALS FOR NINTH PLAN (1997 - 2002)

ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE OF VIII PLAN	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	IX PLAN OUTLAY IN IX PLAN	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2. Upper Kangsabati	UA	43.80	-	-	0.09	43.71	8.00	10	59.00	-	59.00	10	Beyond IX
	3. Dolong	UA	35.00	-	-	-	35.00	8.00	10	22.00	-	22.00	9	Beyond IX
	4. Ajoy Reservoir	UA	70.00	-	-	-	70.00	8.00	10	20.00	-	20.00	9	Beyond IX
	5. Siddheshwari Noorbel	UA	50.00	-	-	-	50.00	8.00	10	55.00	-	55.00	9	Beyond IX
	6. Teesta Barrage Stg. II	UA	111.60	-	-	-	111.60	32.00	40	314.16	-	314.16	14	Beyond IX
	7. Subarnarekha Sarrage	TAC	450.00	2.83	13.27	3%	436.73	50.00	60	130.00	-	130.00	15	Beyond IX
	Integrated Irrigation Schemes	UA	3.60	-	-	0.02	3.58	3.60	4	3.40	-	3.40	3	Beyond IX
			884.00	-	-	13.41	870.59	142.60	174	648.56	-	648.56	84	
		Sub-total A :												
	B. MEDIUM PROJECTS 18 NOS.													
	C. ERM SCHEMES													
	1. Mod. of Kangsabati	UA	172.00	-	-	-	172.00	80.00	98	39.10	-	39.10	30	Beyond IX
	2. Extn. of Danga	UA	186.07	-	-	-	186.07	80.00	100	-	-	-	-	Beyond IX
	3. Rajapukhral Drainage	UA	7.50	-	-	-	7.50	7.50	8	-	-	-	-	IX
		UA	3.44	-	-	-	3.44	3.44	4	-	-	-	-	IX
		Sub-total C :	197.01	-	-	-	197.01	90.94	112	-	-	-	-	
		Total III :	1253.01	-	-	-	1239.60	313.54	384	687.66	-	687.66	114	
	IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS													
	V. DAM SAFETY MEASURES													
	VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)													
	VII. WATER DEVELOPMENT													
	A. SURVEY AND INVESTIGATION													
	B. RESEARCH AND DEVELOPMENT													
	C. TRAINING													
	D. NATIONAL HYDROLOGY PROJECT													
		Total VII :							25					
		GRAND TOTAL :	2636.35	382.38	900.99		1721.95	675.07	1046	1660.50	628.52	1031.98	458	

STATE : PONDICHERRY
DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)

STATE : P O N D I C H E R R Y		RUPEES CRORES / THOUSAND HECTARES												
ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	LIKELY SPILL-OVER COST IN IX PLAN	IX PLAN OUTLAY AT CONSTANT PRICES	IX PLAN OUTLAY IN IX PLAN	PROPOSED OUTLAY IN IX PLAN	ULTIMATE IRRIGATION POTENTIAL	LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	PROPOSED TARGET OF POTENTIAL TO BE COMPLETED IN IX PLAN	PLAN IN WHICH LIKELY TO BE COMPLETED
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
I. LIABILITIES OF COMPLETED PROJECTS														
NIL														
II. ONGOING PROJECTS														
NIL														
III. NEW PROJECTS														
NIL														
IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS														
1														
V. DAM SAFETY MEASURES														
NIL														
VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)														
NIL														
VII. WATER DEVELOPMENT														
NIL														
GRAND TOTAL :										1				

ANNEXURE III(2)

**PROJECTS LIKELY TO BE COMPLETED
DURING IX PLAN**

MAJOR PROJECTS

S.N.	Name of Scheme	Plan in which started
<u>Andhra Pradesh</u>		
1.	Nagarjuna Sagar	II
2.	Sriram Sagar - Stage I	III
3.	Teluguganga	VI
4.	Pulivendula Br. Canal	IV
5.	Vamsadhara Stage I	IV
6.	Singur	V
7.	Somasila	V
8.	Yeleru Reservoir	VI
9.	Jurala	VI
10.	Srisaillam LBC	VI
11.	Vamsadhara Stage II	IX
12.	Srisaillam RBS	VI
13.	Sunkesula Barrage	VIII
14.	Alaganur Bal. Reservoir	VIII
<u>Assam</u>		
15.	Dhansiri	V
16.	Integrated Kollong	V
17.	Champamathi	VI
18.	Bordikerai	V

STATE : PONDICHERRY		DETAILED PROPOSALS FOR NINTH PLAN (1997-2002)														ANNEXURE - III (1)		
ITEM NO.	NAME OF PROJECT	PLAN IN WHICH STARTED	LATEST ESTIMATED COST	LIKELY EXPENDITURE DURING VIII PLAN	LIKELY EXPENDITURE UPTO END OF VIII PLAN	% AGE	7	8	9	10	11	12	13	14	15	RUPEES CRORES / THOUSAND HECTARES		
																LIKELY ACHIEVEMENT OF POTENTIAL UPTO END OF VIII PLAN	LIKELY BALANCE OF POTENTIAL IN IX PLAN	PROPOSED TARGET IN WHICH LIKELY TO BE COMPLETED IN IX PLAN
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
I. LIABILITIES OF COMPLETED PROJECTS																		
NIL																		
II. ONGOING PROJECTS																		
NIL																		
III. NEW PROJECTS																		
NIL																		
IV. SPECIAL REPAIRS OF EXISTING IRRIGATION SYSTEMS																		
1																		
V. DAM SAFETY MEASURES																		
NIL																		
VI. IMPROVED WATER MANAGEMENT (INCLUDING NATIONAL WATER MANAGEMENT)																		
NIL																		
VII. WATER DEVELOPMENT																		
NIL																		
GRAND TOTAL :															1			

ANNEXURE III(2)

PROJECTS LIKELY TO BE COMPLETED
DURING IX PLAN

MAJOR PROJECTS

S.N.	Name of Scheme	Plan in which started
<u>Andhra Pradesh</u>		
1.	Nagarjuna Sagar	II
2.	Sriram Sagar - Stage I	III
3.	Teluguganga	VI
4.	Pulivendula Br. Canal	IV
5.	Vamsadhara Stage I	IV
6.	Singur	V
7.	Somasila	V
8.	Yeleru Reservoir	VI
9.	Jurala	VI
10.	Srisaillam LBC	VI
11.	Vamsadhara Stage II	IX
12.	Srisaillam RBS	VI
13.	Sunkesula Barrage	VIII
14.	Alaganur Bal. Reservoir	VIII
<u>Assam</u>		
15.	Dhansiri	V
16.	Integrated Kollong	V
17.	Champamathi	VI
18.	Bordikerai	V

c.o.p-2

S.N.	Name of Scheme	Plan in which started
<u>Bihar</u>		
19.	Western Kosi Canal	III
20.	North Koel Reservoir	V
21.	Durgavathi	V
22.	Barnar Reservoir	V
23.	Konar Diversion	V
-	Ban Sagar	V
24.	Bateshwarasthan PC	V
25.	Ajoy Barrage Siktia	V
26.	Gumani Barrage	V
27.	Dakranala Pump Phase I	AP 78-80
28.	Sindhwarni	VI
29.	Punasi Reservoir	VIII
<u>Goa</u>		
-	Tillari	AP 78-80
30	Salauli	V
<u>Gujarat</u>		
31.	Panam	IV
-	Mahi Bajaj Sagar	IV
<u>Haryana</u>		
32.	Gurgaon Canal	III
33.	JLN Lift	V
34.	Mewat Lift	IX

S.N.	Name of Scheme	Plan in which started
35.	Gharanda	IX
36.	Jattipur Minor	IX
37.	Ladwa	IX
38.	Nalvi	IX
39.	Ambala	IX
40.	Dev. of Shivalik Hills	IX
	<u>Jammu Kashmir</u>	
41.	Ravi Tawi Irrigation	IX
	<u>Karnataka</u>	
42.	Malaprabha	III
43.	Upper Krishna	IV
44.	Karanja	V
45.	Bennithore	V
-	Dudhganga	V
46.	Hippargi	V
47.	Varahi	VII
48.	Upper Tunga	VIII
	<u>Kerala</u>	
49.	Kanhira Puzha	III
50.	Baypore Puzha	IX
51.	Kakkadavu	IX
52.	Kuriarkutty Karappara	IX

S.N.	Name of Scheme	Plan in which started
------	----------------	-----------------------

Madhya Pradesh

53.	Kolar	IV
54.	Sindh Phase I	IV
55.	Jonk	IV
56.	Upper Wainganga	V
57.	Kodar	V
58.	Man	VI
59.	Jobat	VI
-	Rajghat	V
-	Bawanthadi	V
60.	Pairy	IV
61.	Upper Wainganga	V
62.	Bariarpur LBC	V
63.	Mahi	V
64.	Mahan	VI

Maharashtra

65.	Krishna	III
66.	Bhima	III
67.	Upper Godavari	AP 66-69
68.	Upper Tapi	IV
69.	Upper Wardha	V
70.	Waghur	V

S.N.	Name of Scheme	Plan in which started
71.	Jayakwadi Stage II	V
72.	Surya	AP 78-80
73.	Vishnupuri	AP 78-80
74.	Wan	VI
75.	Upper Penganga	V
76.	Kukadi	III
77.	Upper Pravara	V
78.	Chaskaman	V
79.	Nandur Madhmeshwar	V
80.	Bhatsa	V
<u>Manipur</u>		
81.	Thoubal	AP 78-80
82.	Khuga	VI
<u>Orissa</u>		
83.	Upper Indravati	AP 78-80
84.	Subernarekha	VII
85.	Upper Kolab Irrigation	V
86.	Mahanadi - Chitropala	VIII
<u>Punjab</u>		
87.	S.Y.L. Canal	VI
<u>Rajashtan</u>		
	Gurgaon Canal	III
87.	Mahi Bajaj Sagar	IV

S.N.	Name of Scheme	Plan in which started
88.	Bisalpur	VII
89.	Jakham	III
90.	Somkamalamba	V
	<u>Tamil Nadu</u>	
91.	Anamalaiar	IX
	<u>Uttar Pradesh</u>	
92.	Sarada Sahayak	III
93.	Madhya Ganga Canal	V
94.	Eastern Ganga Canal	V
95.	Rajghat	V
96.	Sone Pump Canal	V
97.	Gyanpur Pump Canal	VII
98.	Chambal Lift	VII
99.	Sarju Nahar	V
100.	Lakhwarwasi	V
101.	Jamrani Dam	V
102.	Jarauli P.C.	AP 78-80
	<u>West Bengal</u>	
103.	Kangsabati	II
104.	Teesta	V

Annexure III (3)

**List of Major Irrigation Project of IX Plan benefiting
Drought Prone Areas**

Sl. No.	Name of Projects	Proposed Outlay in IX th Plan (Rs Crores)
Andhra Pradesh		
1.	Telugu Ganga	1310
2.	Jurala (Priyadarshini)	264
3.	Sreesailam LBC	793
4.	Sreesailam RBC	705
Bihar		
5.	Bansagar (Dam Share)	82
6.	North Koel Res.	35
7.	Durgavathi Res.	69
8.	Konar Diversion	154
9.	Barrar Res.	70
10.	Tilaiya Diversion	108
11.	Auranga Res.	115
Gujarat		
12.	Mahi Bajaj Sagar	-
13.	Sardar Sarovar(Irrigation)	4240
14.	Panam	4
Haryana		
15.	Haryana WRCP (Including Tajewala)	900
16.	Gurgaon Canal	12
17.	SYL Canal	100
18.	J.L.N.Lift	28
Karnataka		
19.	Maleprabha	98
20.	Karanji	114
21.	Bennethore	28
22.	Hippargi Barrage	454
23.	Upper Tunga	412
Madhya Pradesh		
24.	Bansagar Unit I	236
	Unit II	248
25.	Rajghat Unit I	47
	Unit II	243
26.	Man	23
27.	Indira Sagar	230
Maharashtra		
28.	Bhima	115
29.	Krishna	40
30.	Kukadi	134
31.	Jayekwadi St II	495
32.	Upper Godavari	55
33.	Warna	115
34.	Upper Pravara	256

Sl. No.	Name of Projects	Proposed Outlay in IX th Plan (Rs Crores)
35.	Chaskaman	95
36.	Nandur Madhashwar	66
37.	Punad	23
	Orissa	

38.	Upper Indravarthi Irrigation	430
39.	Lower Indra	200
40.	Lower Suktel	100
	Rajasthan	

41.	Indira Gandhi Nahar St I	30
42.	Harishchandra Sagar	Neg.
43.	Sidhmukh Nahar	47
44.	Gurqaon Canal	12
45.	Mahi Bajaj Sagar	21
46.	Narmada Caanal	506
47.	Inira Gandhi Nahar St II	975
48.	Som Komla Amba	14

	Total	14861

Annexure III(4)

List of Major Irrigation Projects of IX Plan
benefitting Tribal Areas

Sl. No.	Name of Projects	Proposed Outlay in IX th Plan (Rs Crores)
	Assam -----	
1.	Dhansiri	94
2.	Integrated Kollong	42
3.	Bordikrai	21
4.	Champamati	42
	Bihar -----	
5.	Ajay Barrage Siktia	40
6.	Subarnarekha	530
7.	Punasi Res.	113
	Gujarat -----	
8.	Zankhari	33
	Kerala -----	
9.	Kanjirapuzha	36
	Maharashtra -----	
10.	Upper Godavari	55
11.	Bhatsa	69
12.	Surya	8
13.	Ghosikhurd	500
14.	Punad	23
	Orissa -----	
15.	Upper Kolab Irrg.	17
16.	Upper Indravati Irrg.	430
17.	Subarnarekha	850
18.	Ong Dam (Chiruli)	100
19.	IX	200
	Total	3203

